IBEX PASS RESOURCE STUDY
AND MANAGEMENT ALTERNATIVES
YUKON TERRITORY

IBEX PASS RESOURCE STUDY AND MANAGEMENT ALTERNATIVES
YUKON TERRITORY

Prepared for
Department of Renewable Resources, Yukon Territory
and
Northern Pipeline Agency, Canada

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January, 1983

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NOTE

A contribution to the description of the physical characteristics of the study area was provided by Thurber Consultants Ltd.

I. INTRODUCTION

PREAMBLE

The Ibex Pass is located generally to the west of the City of Whitehorse, Yukon Territory (Figure 1). Because of its inherent biophysical properties and its geographical relationship to existing settlements, transportation and utility corridors and other land uses, the area represents an important focus for institutional decision-making respecting land management. Events of recent years, notably circumstances surrounding route selection for the Alaska Highway Gas Pipeline Project and the completion of documents such as Whitehorse North Land Management Planning Project (1979), have dictated that discrete pieces of information about the Ibex Pass area be accumulated, analysed and developed into a comprehensive document that provides a sound basis for future land use decisions. Importantly the document should not be a treatment of the Ibex Pass area in isolation from its district and regional linkages, but rather the document should identify the significance of these broader geographical relationships in the context of detailed information developed for the study area.

The scope and findings of the study are directed to a long-term future towards which land use management decisions may be made that recognize and respond to rather than jeopardize the resources, the capabilities and the values of the study area to the people of the Yukon and Canada.

PURPOSE OF STUDY

The purpose of the study is to prepare on the basis of found information from written, oral and visual sources, a resource inventory and analysis in a local and regional context, as well as a set of management alternatives for the Ibex Pass area. In fulfillment of this purpose the study evaluates the planning area with respect to resource capability, constraints to development, development pressures or

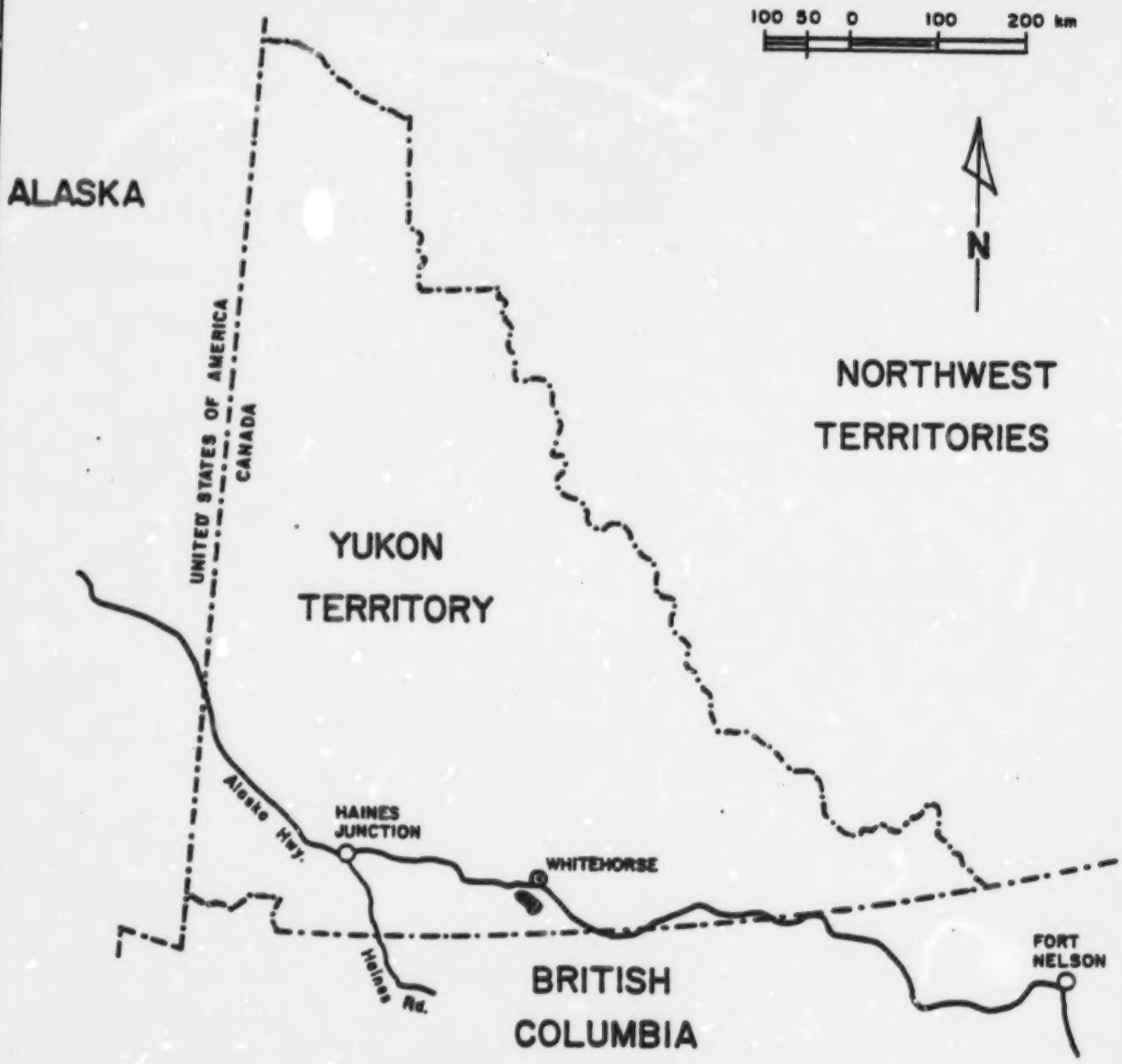
initiatives, and geographical areas or land uses inherently displaying conflicts. The presentation of management alternatives provides guidance on the implications of adopting each alternative, including monitoring and management requirements, and the environmental, economic and social costs attached.

THE STUDY IN CONTEXT

One of the requirements of the study is that there be provided at least two management alternatives for the Ibex Pass area based on the resource evaluation. These alternatives must consider the prospect of the Alaska Highway Gas Pipeline Project being routed through the Ibex area on the one hand and on the other, the prospect of the pipeline not being routed through the area. (The latter implies that there would be the selection of some other alignment in the general vicinity of the Alaska Highway to the north and east of the study area.) In the event that the pipeline were to be routed through the Ibex area this would be one of a few geographical locations in Yukon where the pipeline made a significant departure from the Alaska Highway alignment in the territory.

The matter as to whether the pipeline might be routed through the Ibex area has become an important focus in the ongoing evaluation of the application by Foothills Pipe Lines (South Yukon) Limited to receive approval for the project. The sequence of events concerning this aspect of potential land use may be usefully pursued here for two reasons. First, the discussion will place in perspective the later analysis of management alternatives bearing the "with" and "without" pipeline scenarios. And second, the advent of the "Ibex route" recognized by Foothills Pipe Lines has served as a catalyst for the present, more broad-based consideration of desirable strategies for land use futures generally in the Ibex area. Such an exercise eventually would have had to take place because of the rather complex set of land administration arrangements affecting the region wherein the Ibex Pass area lies. Consequently, some observations on administration and planning also will be made to set the stage for the rest of the study.

IBEX PASS STUDY



Location Map

STUDY AREA

REID, CROWTHER & PARTNERS LTD. WHITEHORSE, YUKON TERRITORY	
DATE: 82 NOV. 10	FIGURE: 1

The Alaska Highway Gas Pipeline

A brief chronology of events surrounding the documentary history of the Alaska Highway Gas Pipeline Project is shown in Appendix A. In its August, 1979 report the Environmental Assessment Panel, chaired by F.G. Hurtubise, observed:

> During the 1977 and 1979 hearings, concern was expressed for the Dall's sheep and raptor populations in Ibex Pass, and for aesthetic and recreational land use values of the area. The Proponent has identified a number of possible alternatives that were given preliminary evaluation. One route which follows the Alaska Highway, crossing the Yukon river 4 km upstream of the mouth of the Takhini River, and passing north and east of Whitehorse, was examined in greater depth, but found by the Proponent to be less favourable than the Ibex Pass Route on the basis of combined environmental, socio-economic and engineering factors. The Panel seeks further justification for the rejection of this alternative. A high degree of concern was expressed by intervenors in the 1977 and 1979 hearings with respect to alternatives to the Ibex Pass Route. The Panel was advised that all possible alternatives have not been assessed (EAP 1979:43).

The panel concluded that detailed maps and a report should be prepared by the proponent showing all factors likely to bear on route selection. These documents then were to be used as a basis for a comprehensive description and comparison of the preferred route and potential alternatives, and the probable impact of pipeline construction along the routes. Factors to be considered were to include impact on wildlife populations and their habitat, potential for terrain degradation, visual impact and effect on recreational values. Specific mapping requirements also were itemized (Table 1).

During 1981 several documents were released by Foothills Pipe Lines. Two of these are particularly pertinent to the Ibex Pass: Examination of Routing Alternatives for the Alaska Highway Gas Pipeline in the Whitehorse/Ibex Region (Submission 3-1); and Mapped Information Requested by the Federal Environmental Assessment and Review Office

TABLE 1

1979 EAP MAPPING REQUIREMENTS FOR
ALASKA NATURAL GAS PIPELINE IN IBEX PASS AREA

The maps should show:

1) Delineation of the terrain units (determined by air-photo interpretation with such field checking as may be required).

2) Wildlife habitat, in the context of raptors, grizzly bears and Dall's sheep wintering, lambing and rutting range, and mineral licks.

3) The preferred route and other potential routes that are feasible from an engineering standpoint. Such routes should be refined to the degree possible on the basis of terrain mapping suggested in 1) and any environmental, land use or other constraints known to the Proponent.

4) Existing access roads and trails; access roads that would be required for the preferred route and alternatives, including realignment or upgrading of existing roads and trails.

5) Dam, ditches, pipelines and other structures associated with the Yukon Electrical Company development in Fish Lake-Jackson Lakes-Porter Creek area.

6) Open pits, tailings disposal sites, mill sites, water supply and sewage disposal facilities and other structures and facilities of Whitehorse Copper mines, particularly where these impose constraints on route selection.

7) Land ownership and land use where relevant to the preferred and alternate routes.

8) Recreational use area, whether officially designated or not.

Source: EAP 1979: 44-45.

Related to the Whitehorse/Ibex Pass Region (Submission 3-2). In the former document the authors state:

> The conclusion reached as a result of the evaluation process was that, from an overall point of view the Ibex Pass route is superior to all other alternatives. This conclusion was reached because the Ibex Pass route involves the lowest construction cost, the lowest risk of impacts on existing and planned land-uses and the lowest risk to public safety resulting from third party damage to the pipeline in built-up areas. Balanced against these advantages the Ibex Route involves the greatest risk of environmental impacts. None of the other routes examined offer a similar combination of advantages. Of the four alternatives that offer a low level of possible environmental impact, all have a high potential for land-use conflicts as well as a higher risk to safety due to third party construction activity and three involve costs that are in the upper half of the range of cost estimates made for the eleven alternatives.
>
> In selecting the Ibex Route the Project has chosen to avoid undue construction costs and the risk of long-term impacts upon land-use and public safety in the Whitehorse area and to accept the costs of special designs, construction procedures and schedules required to reduce environmental impacts. To ensure that the latter requirements are adequately met, long-term environmental studies have been undertaken within the Ibex Pass region. These studies will be continued as preparations for construction are made and information gathered will be applied rigorously to reduce environmental impacts. Commitment to this approach has been made publicly on many occasions and is held strongly by the Project (Foothills 1981).

In its report on the 1981 public hearings into routing alternatives in the Whitehorse/Ibex region the Environmental Assessment Panel observed that:

> The subject of the relationship between existing and planned land-uses and route selection was a topic of considerable discussion at the technical hearings. The fact that the Ibex route had, in the opinion of the Proponent, the lowest risk of impacts on existing and planned land-uses was one of the three main reasons for selecting that alternative. Information was presented which described known and planned land-uses along the other route alternatives. The Proponent noted that consideration should be given to yet unplanned expansion around urban and subdivision populations as the pipeline had a life expectancy beyond most planning studies. However, there

were no briefs submitted from government agencies which dealt with land use planning issues (EAP 1981: 15-16).

The panel's conclusion on the Whitehorse/Ibex pipeline routing selection was that because of the attendant loss of future options on the connection with the proposed Dempster Lateral Pipelines, the Ibex Valley Route Alternative ... should be rejected" (Ibid.). Preference was stated by the panel for the First Whitehorse Route with the West Whitehorse Cut-off.

On the day that the findings of the 1981 EAP were released (August 5, 1981) Foothills Pipe Lines (South Yukon) Limited issued a press release which stated:

> Foothills has received the report of the Environmental Assessment Panel on Routing Alternatives Whitehorse/Ibex Region for the Alaska Highway Gas Pipeline. Foothills does not argue with the panel's conclusion that the Ibex Valley Route Alternatives should be rejected.
>
> As stated in its submission to the Panel, Foothills agrees that the Ibex route is more environmentally sensitive than any other route but maintains that the potential for long-term damage to the environment is low.
>
> The panel's major concern appears to be that after installation of the pipeline easier access by an existing road improved for construction will remain. Foothills maintains that easy access is available now and when construction is completed access can be made difficult to a degree sufficient to prevent public travel with wheeled vehicles.
>
> The panel has recommended that the route for the pipeline should be one south and west of and paralleled to the Alaska Highway. The people affected by such an alternative choice will need to be given an opportunity to comment.
>
> Foothills will thoroughly review the Panel's report prior to making application to the NPA for final approval for a route location. Foothills notes that the panel consisting of six well respected experts in environmental matters were essentially assessing and reporting on route alternatives from an environmental viewpoint.

Land Administration and Land Use Planning

On the second matter, that of administration and planning as it pertains to the study area, the following introductory remarks are in order. Appendix A shows that there are a number of documents which bear directly on land use and land mangement in the Ibex Pass area. They have been prepared during the same period (i.e., 1977-present) in which there has been documentation and discussion of the Foothills pipeline project.

J.W. Wilson (1979) in a paper on government land use policies in south Yukon recognizes that in the territory there are three levels of government - local, Yukon Territorial and Federal. Citing other sources he points out that the management of crown lands in the territory has, in recent years, assumed a high level of complexity as a result of increased demand for land, land use conflicts associated with this increase, and a high level of visibility concerning land use issues in the territory. This condition is likely to persist in light of recent developments concerning northern land use planning (RCPL 1982).

For the study area per se lands are primarily administered by the Northern Affairs Program of the Department of Indian Affairs and Northern Development (DIAND), but when the lands adjacent to the Ibex Pass area are considered a more complex picture emerges. In this larger district lands may be administered by the federal government, by the Government of Yukon or by the City of Whitehorse. Canada Lands are managed by DIAND under the Territorial Lands Act and regulations made under the act. These differ from the Yukon's Lands Ordinance and Regulations. In addition legislation such as the Yukon Quartz Mining Act and Yukon Placer Mining act may substantially influence land use, and affect the ability of the Yukon government to manage land within its jurisdiction since the above-mentioned acts supersede the powers of the Yukon government.

The presence of the Government of Canada in the Yukon is pervasive. Inasmuch as DIAND controls all land in the Yukon other than that which has been alienated to the Yukon Territorial Government and to

private individuals and firms, the federal government has a substantial continuing interest in the administration of land. Federal crown land is made available to individuals under lease, lease agreement (with option to purchase) or sale agreement and may also involve matters such as easements, licenses of occupation, map reservations and Order-in-Council transfers. The majority of applications and dispositions of federal crown land in Yukon are for residential, recreational, commercial and agricultural uses. Generally the following procedures are applied to applications received by the federal government:

1) a moratorium on land dispositions for planning purposes may be applied in planning areas pending approval of the plan;

2) residential lands are generally not encouraged outside existing communities because of the Government of Yukon's desire to minimize the costs of services within existing settlements and to promote and encourage community development. Rural residential use may occur, however, provided it meets criteria with respect to suitability, location away from communities, and minimum and maximum parcel size;

3) no grants of agricultural or grazing lands will be made pending the formulation of a Territorial Government agricultural policy - applications for market gardens are considered on their merit;

4) cottage lots are made available only in planned subdivisions. Disposition on cottage lots is now a responsibility of the Territorial Lands Offices;

5) applications for land for the purpose of sport fishing lodges are not being granted until such time as sufficient information is available to ensure the management of the fishery resource on a sustained yield basis;

6) other applications for commercial uses outside of existing communities are considered on their merit, particularly with respect to economic viability and compatibility with adjacent uses;

7) decisions on industrial projects such as mines, are made at senior and political levels; and

8) lands identified as being of native interest are not being made available for release or development pending land claim negotiations.

The Yukon Territorial Government has several very important land functions to perform, principally because it owns small areas of land in Block Land Transfers, that is, lands transferred by the Government of Canada to the Yukon Territorial Government. This gives rise to several different land planning and development situations. In Whitehorse, for example, the Yukon Territorial Government acts as land developer for the City, and arranges for the necessary capital, which in turn is provided by the federal government. In the Block Land Transfer, especially those on the outskirts of the City of Whitehorse (effected in 1971), it is responsible for planning, selling, leasing and servicing the lands it administers.

We would note in passing that in terms of legal control over the use of alienated land in the Yukon, the Yukon Territorial Government has zoning jurisdiction directly through the Area Development Ordinance (R.O. 1958c7) and indirectly through the Municipal Ordinance. But of course it has little jurisdiction over federally owned lands or Indian reserves. The Area Development Ordinance is a form of land use control legislation that allows the Commissioner to make regulations for the orderly development of an area respecting zoning and the allocation of land for agricultural, residential, business, industrial, educational, public or other purposes and applies to <u>all</u> designated land, not only to those lands known as Commissioner's Lands. Although under this ordinance the territorial government controls zoning, it has no direct control over dispositions, since title is still issued by the federal government.

As to the City of Whitehorse it is notable for its vast areal extent (162 sq. miles; 22 miles north to south). Until 1973 the administrative jurisdiction of the city coincided substantially with the developed urban area, which is relatively small. Thus the city's land administration responsibilities increased drastically, both in nature and in scale, recently and suddenly. The Yukon Territorial Government holds most of the unalienated land in the city and acts as the city's land developer, responding yearly to the needs projected by the City.

In recent years efforts have been made to provide for a more coordinated approach to planning in the region in which the study area lies. These efforts principally have been reflected in the Whitehorse North Land Management Planning Project (WNLMPP) and in exercising the Area Development Act (Appendix A). The area addressed in the WNLMPP includes almost all of the study area (Fig. 2) and is almost coincident (except along its eastern margin) with the boundary of the "Interim Whitehorse Periphery Development Area Regulations (IWPDAR).

The IWPDAR were established under the provisions of the Area Development Ordinance which enables the Commissioner to make regulations controlling the use of land. The IWPDAR were passed in 1978, providing for controls outside the City of Whitehorse in the area shown on Figure 2. The original Commissioner's Order was subsequently amended on a number of occasions. The original order stated:

> It is the intention of these regulations that the primary purpose for which land and premises within the Whitehorse Periphery Development area are used is a residential purpose restricted to the orderly development of single family residences on lots or parcels of a large minimum acreage and that the secondary or auxilliary purposes for which these lands and premises are used are related to and consistent with the primary purpose (C.O. 1978/110s6).

Later amendments (Appendix A) relaxed certain provisions regarding the subdivision of existing parcels of lands or the creation of lots from existing leased parcels, and placed more stringent controls on commercial recreation areas.

Reference to the Whitehorse Periphery Area in the regulations included two development areas, Whitehorse South and Whitehorse North (Fig. 2). The latter area is of interest to this study in that in addition to the regulations passed under the Area Development Ordinance, Whitehorse North became the focus of the WNLMPP. The purpose of the study was to recommend land management principles and a land management

plan that would meet the anticipated demands on federal and YTG lands in the Whitehorse area, while respecting the inherent limitations of the landscape. A large number of recommendations generated by the study subsequently were adopted by the Government of Yukon Territory. The content and the status of these recommendations thus are pertinent to the present study and are discussed in the report.

One further institutional arrangement is worthy of note. In 1977, the federal government by Order-in-Council (P.C. 2859) set aside a swath of federal and Yukon land, approximately 8 km wide within which no disposition of land would be permitted until the precise route of the Alaska Highway Natural Gas Pipeline is established. In the vicinity of Whitehorse the corridor widens to allow for two possible routes around Whitehorse. This is significant in that a large area of land has been withdrawn from disposition until the prime route is more firmly established. The corridor will then be narrowed to about 500 m, and further narrowed upon and after construction.

All of the above is of general significance to the study area. At the time the WHLMPP was being finalized, Wilson (1979) concluded that land planning in the Whitehorse area was notable for two weaknesses: the absence of adequate basic data; and a land policy vacuum. On the latter matter he observed:

> there appears to be a serious land policy vacuum in the Whitehorse area as a whole. I say serious because in the first place the absence of effective policies seems quite apparent to at least some local residents. In the second place the presumably interim, uncoordinated policies which now exist will, if continued, result in an increasingly dispersed rural settlement patterns, and this will impose additional travelling costs on all concerned, both residents and government agencies providing school, fire and ambulance services.
>
> Specifically; the City in effect bans rural settlement; there has been no active land disposal policy for the B.L.T. areas beyond the City's boundaries; and so rural settlers are compelled to seek land further out. This is not the place to argue that case on one side or another. It is a good place to

point out how incoherent and unresponsive the overall land administration program is seen to be from outside government, at least from the point of view of the prospective rural settler (Ibid.).

THE GEOGRAPHICAL SETTING

The Ibex Pass area lies within the Boundary Ranges of the Coast Mountains which is a primary physiographical subdivision of the Canadian Cordilleran Region. Slopes are typically high and precipitous, with jagged, knife-edge ridges and pointed peaks reaching elevations of more than 2000 m. Maximum relief in the area is approximately 1500 m. Virtually the entire study area drains by way of Ibex River to the Takhini River which flows east into Yukon River and thence to the Bering Sea.

The area is peripheral to the principal focus of settlement and development in Yukon Territory, the City of Whitehorse. Settlement and development continues adjacent to the study area, but in a more modest form, along its northern and eastern margins. These latter elements of human activity are primarily linear in nature, with occasional nodes of more intense settlement and land use, and are closely identified with the presence of and reliance upon the Alaska Highway. The proximity of the Ibex Pass area to these regions of increased population density has resulted in recognition of and reliance upon certain resources and landscapes within the study area.

THE STUDY AREA

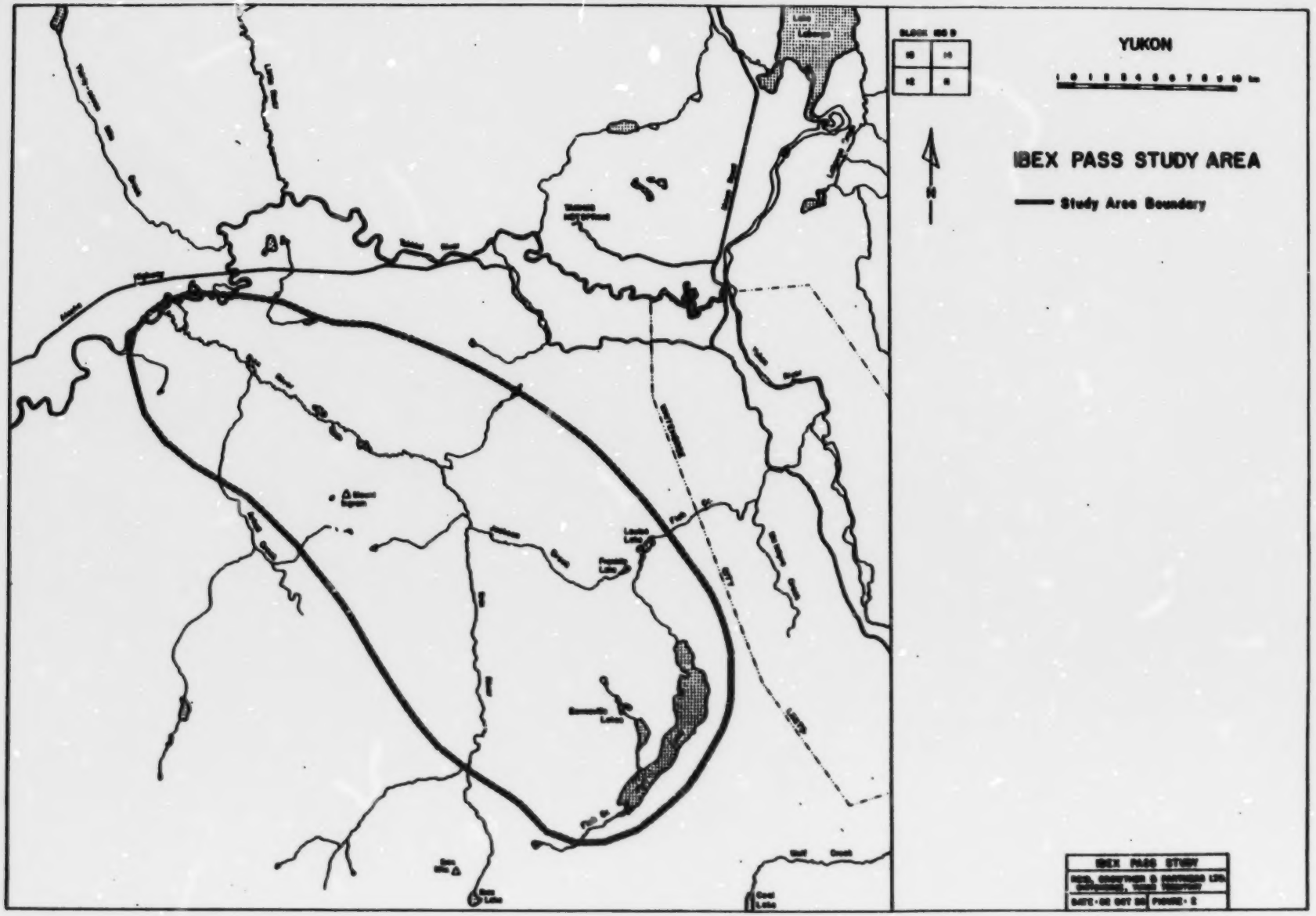
The primary study area is outlined on Figure 2. This area is the focus of detailed inventory work and associated analysis presented in the report. Clearly, however, from the standpoint of biophysical relationships that extend beyond the designated study area boundary and human responses expressed in terms of land use, land management and institutional arrangements generally, a larger region also must be identified to facilitate selection of management alternatives. This

larger region is conveniently contained in the 1:250,000 Whitehorse Northwest Quadrant, NTS sheet which constitutes the base map on which the study area is shown. The 1:250,000 map has been scaled to 1:100,000. For the purposes of discussing the study area in the context of south Yukon, a smaller scale map also is included (Fig. 1).

STUDY APPROACH

The report has been developed principally from found sources with limited field checks conducted on readily accessible areas. Two principal types of available information sources were utilized. The first consisted of the substantial body of published and unpublished information available in the form of reports, manuscript materials, agency files, maps, aerial photographs and other materials. Most of these sources were accessed in Whitehorse and Calgary and they are itemized in the Bibliography and in Appendix B. Some important sources briefly may be identified. These included the information generated in regard to Foothills Pipe Lines (South Yukon) Limited's application for a natural gas pipeline route, principally Foothills' documents, transcripts of public hearings and associated briefs, the various reports released by Environmental Assessment Panels established by the Federal Environmental Assessment and Review Office (FEARO) and the Northern Pipeline Agency. Much in the way of biological information for the Ibex Pass area has been generated through the Yukon Ecological Land Survey (ELS) and the inventory, analysis and mapping exercises undertaken by Yukon, Department of Renewable Resources. All of the ELS material, whether in map or text form, was made available to the consultant. Similarly other pertinent documents were contributed by federal and territorial agencies in Whitehorse and the City of Whitehorse.

The second principal type of information emanated from a substantial number of interviews conducted by the consultant with staff of public and private agencies having select responsibilities in the study area; with individuals who live in and/or use the study area; and with others who as individuals or representatives of organizations expressed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IBEX PASS STUDY AREA
Study Area Boundary
N

opinions on aspects of the management and use of the area. A listing of these contacts is provided in Appendix C.

During the course of the study regular meetings were held with the client to discuss the direction, conduct and progress of the study.

ORGANIZATION OF THE REPORT

The second chapter of the report determines the biophysical conditions of the study area and describes existing forms of land use. The capability of the study area to support potential land use activities is then examined. The adequacy of the data base from which the preceding information has been developed is reviewed; and the chapter concludes with a discussion of problems and issues in land use.

Chapter III presents a series of possible approaches to the management of individual resources in the study area. A goal (or goals) for the management of individual resources is articulated and a series of alternatives or strategies set out which could be used as a basis for implementing the desired goal (or goals). These strategies are followed by a presentation on possible land use decisions which could flow from the alternatives.

In Chapter IV sets of potential resource management strategies are discussed, the strategies ranging along a spectrum from emphasis upon landscape and habitat conservation and limited land use activities, to emphasis upon integrated use within more broadly defined parameters for conservation in the study area. These potential resource management plans are translated into sets of concept plans in Chapter V.

Two maps are used for each concept plan. The first identifies zones to facilitate placement of potential activities. The second map recognizes potential activities for these zones.

In Chapter VI there is a brief discussion of the implications of the alternative management strategies and concept plans. The text concludes in Chapter VII with a discussion of future requirements. Supporting documentation is provided in the Bibliography and Appendices.

II. RESOURCES, LAND USE AND LAND MANAGEMENT

INTRODUCTION

Chapter II is a comprehensive analysis of all available information regarding biophysical conditions and land use in the Ibex Pass study area. In addition, a detailed assessment has been carried out on the overall capability for potential land use from both a regional and local perspective. In order to ascertain where inadequacies exist in this material, a special section has been prepared which outlines any problems or requirements within the data base. The final segment of this inventory addresses what the consultant considers to be the most important issues regarding land use.

BIOPHYSICAL CONDITIONS

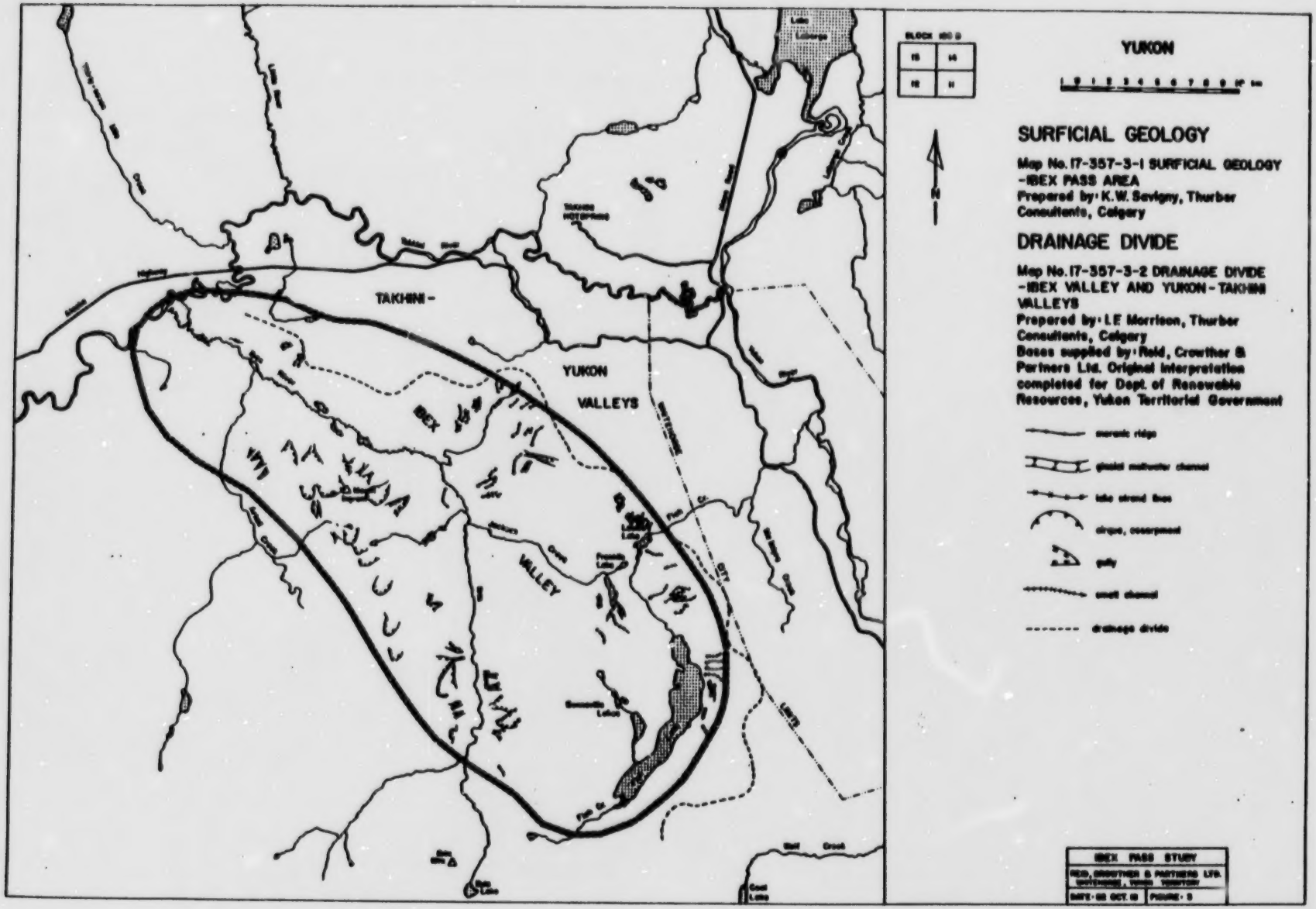
Physical Characteristics: Study Approach

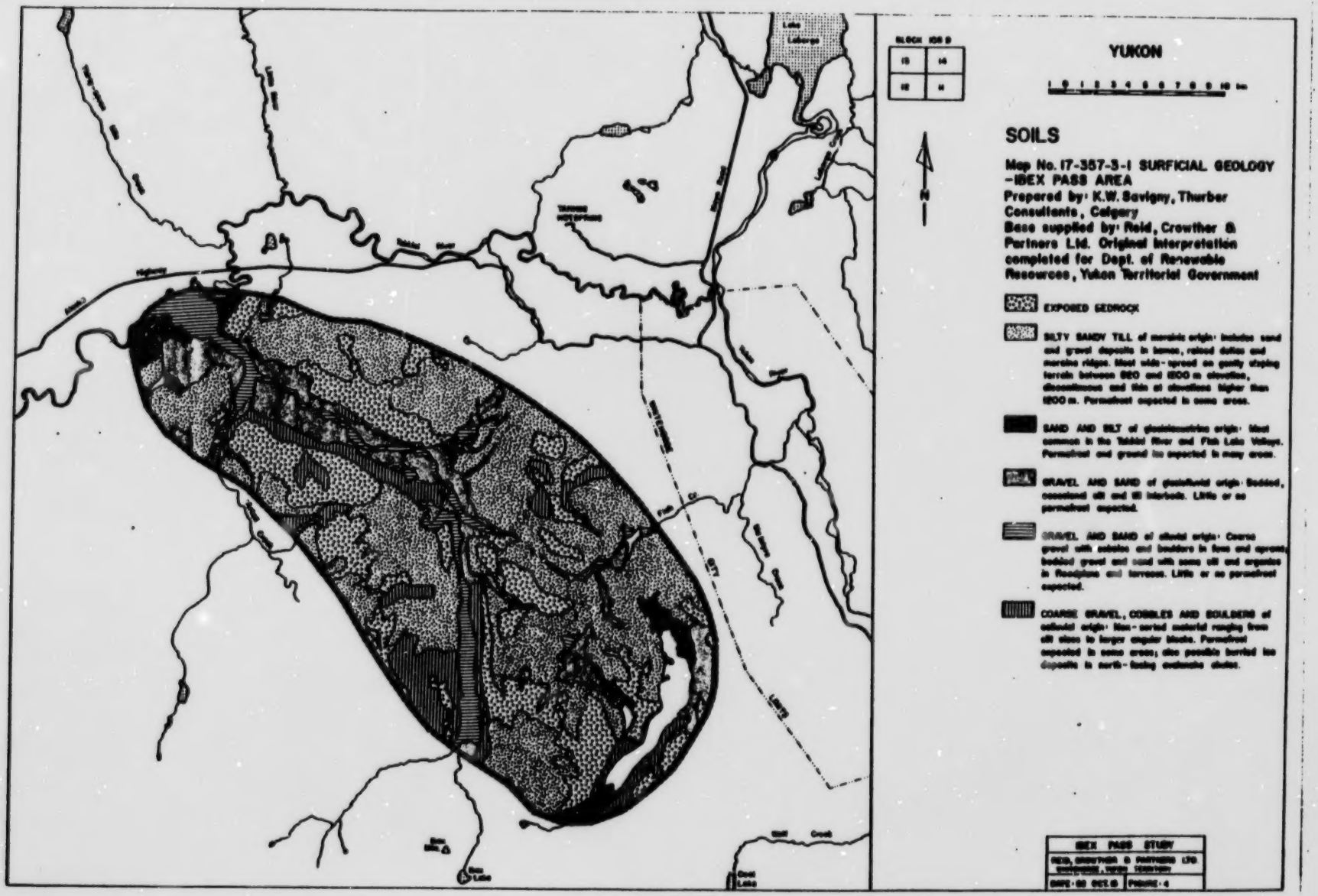
A review of published geological maps and reports was completed at the beginning of the study. This was followed by a review of climatological data for the Whitehorse area. Finally, all pertinent terrain and engineering information on file in the library of the Northern Pipeline Agency in Calgary was reviewed. A listing of all literature reviewed is included in the Bibliography.

A terrain analysis was completed using black and white stereo air photos (scale 1:50,000) taken in 1979. Aspects of surficial geology which were delineated as part of this terrain analysis were in total agreement with maps of terrain types included in the Environmental Impact Statement - Addendum (1979). This information is presented in Figures 3 and 4.

Physiography

The Ibex Valley area lies within the Boundary Ranges of the


TAKHINI -
YUKON
VALLEYS
IBEX
VALLEY
YUKON
SURFICIAL GEOLOGY
Map No. 17-357-3-1 SURFICIAL GEOLOGY -IBEX PASS AREA
Prepared by: K.W. Sevigny, Thurber Consultants, Calgary
DRAINAGE DIVIDE
Map No. 17-357-3-2 DRAINAGE DIVIDE -IBEX VALLEY AND YUKON - TAKHINI VALLEYS
Prepared by: L.E. Morrison, Thurber Consultants, Calgary
Bases supplied by: Reid, Crowther & Partners Ltd. Original interpretation completed for Dept. of Renewable Resources, Yukon Territorial Government
moraine ridge
glacial meltwater channel
lake strand line
cirque, escarpment
gully
melt channel
drainage divide
IBEX PASS STUDY


YUKON
SOILS
Map No. 17-357-3-1 SURFICIAL GEOLOGY -IBEX PASS AREA
Prepared by: K.W. Savigny, Thurber Consultants, Calgary
Base supplied by: Reid, Crowther & Partners Ltd. Original interpretation completed for Dept. of Renewable Resources, Yukon Territorial Government
EXPOSED BEDROCK
SILTY SANDY TILL of morainic origin: Includes sand and gravel deposits in kames, raised deltas and moraine ridges. Most wide-spread on gently sloping terrain between 920 and 1200 m elevation, discontinuous and thin at elevations higher than 1200 m. Permafrost expected in some areas.
SAND AND SILT of glaciolacustrine origin: Most common in the Tabbist River and Fish Lake Valleys. Permafrost and ground ice expected in many areas.
GRAVEL AND SAND of glaciofluvial origin: Bedded, occasional silt and till interbeds. Little or no permafrost expected.
GRAVEL AND SAND of alluvial origin: Coarse gravel with cobbles and boulders in fans and aprons; bedded gravel and sand with some silt and organics in floodplains and terraces. Little or no permafrost expected.
COARSE GRAVEL, COBBLES AND BOULDERS of colluvial origin: Non-sorted material ranging from silt sizes to large angular blocks. Permafrost expected in some areas; also possible buried ice deposits in north-facing avalanche chutes.
IBEX PASS STUDY
FIGURE 4

Coast Mountains which is a primary physiographic subdivision of the Canadian Cordilleran Region. The mountains are formed in folded sequences of greywacke and conglomerate with a core of granite. Slopes are typically high and precipitous, with jagged, knife-edge ridges and pointed peaks reaching elevations of more than 2,000 m. The area has been innundated by alpine glaciers that created cirques, broad U-shaped valleys and a variety of depositional landforms. Small rock glaciers, which are remnants of the alpine glaciers, lie in north facing cirques of Mt. Ingram, the highest peak in the area. Maximum relief in the area is approximately 1,500 m (refer to Figure 3).

Tectonics

The sedimentary bedrock in the study area formed in a shallow sea between 180 and 220 million years ago. These rocks were intruded by granitic rocks and uplifted between 80 and 140 million years ago.

Uplift forces are still active southwest of the study area. These forces occasionally cause movement along northwest trending transcurrent faults such as the Shakwak, Duke River and Dalton Faults (Claque, 1979), which also lie southwest of the study area. Earthquakes related to movement along these faults and second and third order faults can be felt in the study area. The study area is therefore considered to be a zone of intermediate to high seismicity with accelerations of 10% to 20% of gravity on a 100 year return period (Leblanc and Hasegawa, 1974).

Glaciation

Four advances of cordi_leran alpine glaciers have been recognized in the southern Yukon (Rostock, 1966). Glacial features related to the last major advance referred to as the McConnell advance are well preserved in the study area and generally cover all evidance of earlier advances.

The pattern of glacial movement appears to have been north along the Yukon River valley and then west along the Takhini River valley. Ice forming in the Mt. Ingram area and on adjacent peaks probably moved out via the Ibex River valley to coalesce with the main cordilleran ice mass in the Takhini valley. During deglaciation meltwater appears to have moved through a complex series of meltwater channels and proglacial lakes while draining in a generally northern direction. Large deltas and shoreline features can be found at elevations of 1200, 1050 and 820 m indicating at least three quasi-stable glacial lakes existed in the area during deglaciation (refer to Figure 3).

Surficial Soils

The distribution of surficial soils is shown in detail on maps of terrain types in the Whitehorse-Ibex region which are included with the Environmental Impact Statement - Addendum (1979). This information has been incorporated into the Soils Map (Figure 4) contained in this report.

Morainic soil consisting of sandy till is the most common surficial soil in areas above 820 m elevation. It is most widespread on gently sloping terrain between 820 and 1200 m elevation, and is discontinuous or absent at elevations higher than 1200 m and on steeper slopes below this elevation. Sand and gravel deposits in kames and raised deltas are found in association with till in a few locations between elevations of 820 and 1200 m.

Glaciofluvial and alluvial soils consisting of gravel and sand are found along Ibex valley and its tributaries. These soils were laid down by glacial meltwater and have been reworked to some extent by modern rivers and streams. Some granular deposits are also found in alluvial and colluvial fans and aprons at the mouths of tributary streams and along the base of steeper valley slopes.

Glaciolacustrine silt and sand is widespread in the Takhini

River valley at elevations below approximately 750 m. These soils have been extensively reworked by modern streams creating almost vertical cuts up to 20 m high, and alluvial deposits of sand and silty sand along the stream courses,

Organic soil is generally continuous over the flat-lying glaciolacustrine silt and sand, but is thin and discontinuous in other areas and over bedrock.

Drainage

Virtually the entire study area drains via Ibex River into Takhini River which flows east into Yukon River and thence to the Bering Sea. Drainage divides between the major valleys are shown on the Surficial Geology Map (refer to Figure 3).

Climate

The southern Yukon is an area of diverse topography and variation in elevations, latitude, local relief and surface type are such that great variations in local climate exist within the generalized patterns. The density of stations in the Yukon is such that most of the local climates are not sampled.

Winters in the southern Yukon are cold and summers are moderate. The frost-free growing season is short and frost can occur in any month of the year. Serious weather events are rare. The most notable feature of the climate of the southern Yukon is the extremely low winter temperatures.

Climatological data from Whitehorse airport are summarized in Appendix D. These data are considered representative of the study area.

Permafrost

The area is classified within the zone of widespread discontinuous permafrost according to the permafrost map of Canada. Permafrost is not expected in glaciofluvial, alluvial or colluvial sand and gravel on the valley floors or in till deposits at elevations below 1000 m. Permafrost evidence is present in glaciolacustrine silt and sand, especially in poorly drained and shaded areas of the Takhini River valley, although it is not expected to be continuous in these soils. Ground ice is likely to be present where the glaciolacustrine silts and sands are perennially frozen.

Vegetation

The Ibex study area is situated within the Boreal Forest Region as described by Rowe (1972) and in this broad category it belongs more specifically to the central Yukon Forest Section. Characteristic tree species are white spruce, lodgepole pine, trembling aspen and balsam poplar. Other species which occur less frequently are black spruce, tamarack, alpine fir and paper birch (refer to Figure 5).

The vegetation communities which are present have been described in more detail on the basis of ELS maps and legends, and to a small extent, forest cover maps for the pipeline corridor and information contained in the Whitehorse North Periphery Planning Study (1979). The ELS information provided the most detailed information from a current source. The other references were less useful because they concentrated on areas peripheral to the Ibex study area. The fire management office (K. Koepke, pers. comm., 1982) indicated that the most recent major burn occurred in 1958 (refer to Figure 5). Minor burns since this time are not mapped or discussed as their location and extent are unknown. It appears that only spot fires have occurred since the major burn in 1958 (Dumas, pers. comm. 1982).

The vegetation of the study area can be discussed in terms of

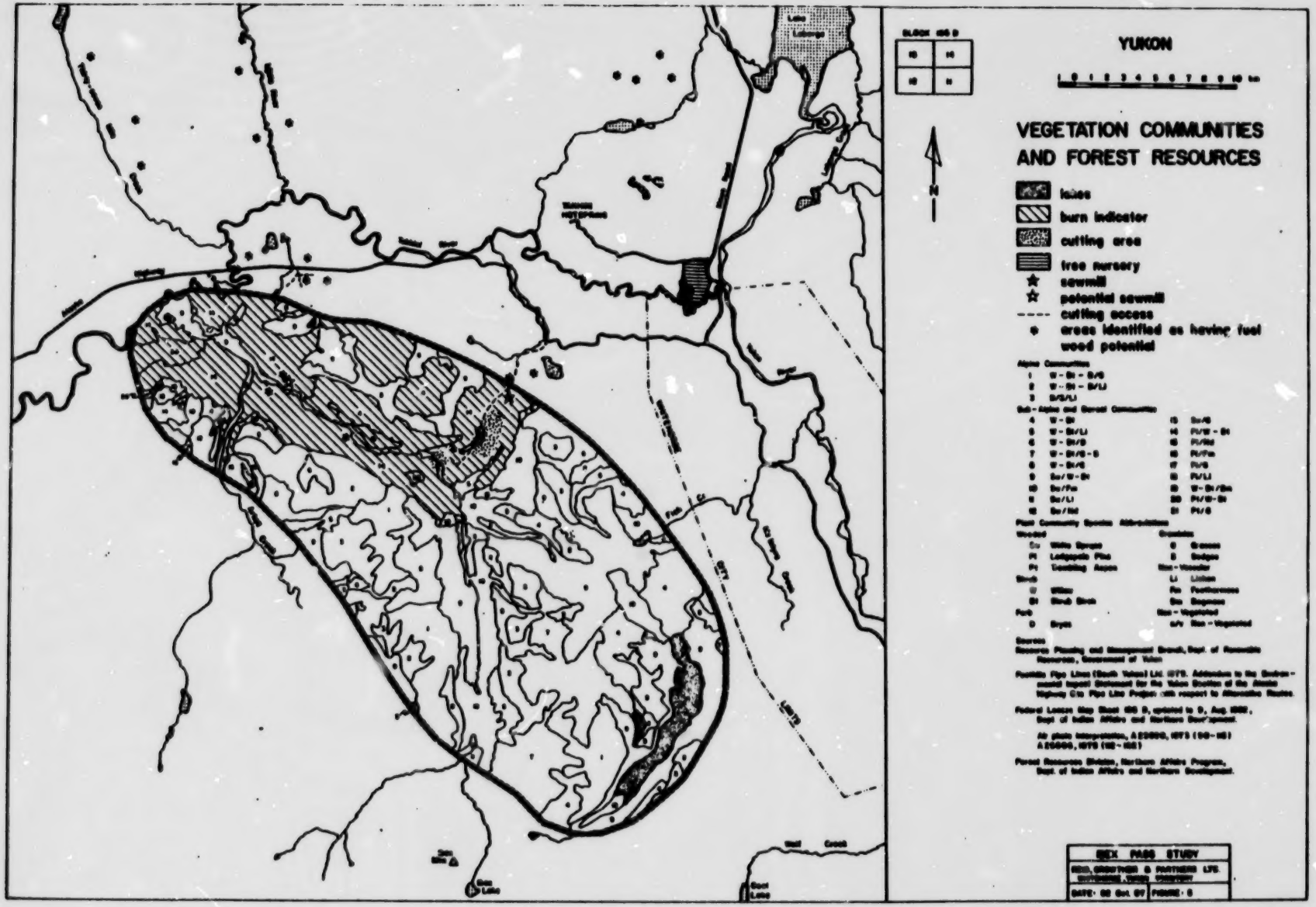

YUKON
VEGETATION COMMUNITIES
AND FOREST RESOURCES
lakes
burn indicator
cutting area
tree nursery
sawmill
potential sawmill
cutting access
areas identified as having fuel
wood potential
Alpine Communities
Sub-Alpine and Boreal Communities
Plant Community Species Abbreviations
Sources
Pipeline Pipe Lines (South Yukon) Ltd. 1975. Addendum to the Environmental Impact Statement for the Yukon Section of the Alaska Highway Gas Pipe Line Project with respect to Alternative Routes
Forest Resources Division, Northern Affairs Program,
Dept. of Indian Affairs and Northern Development.
SEX PASS STUDY
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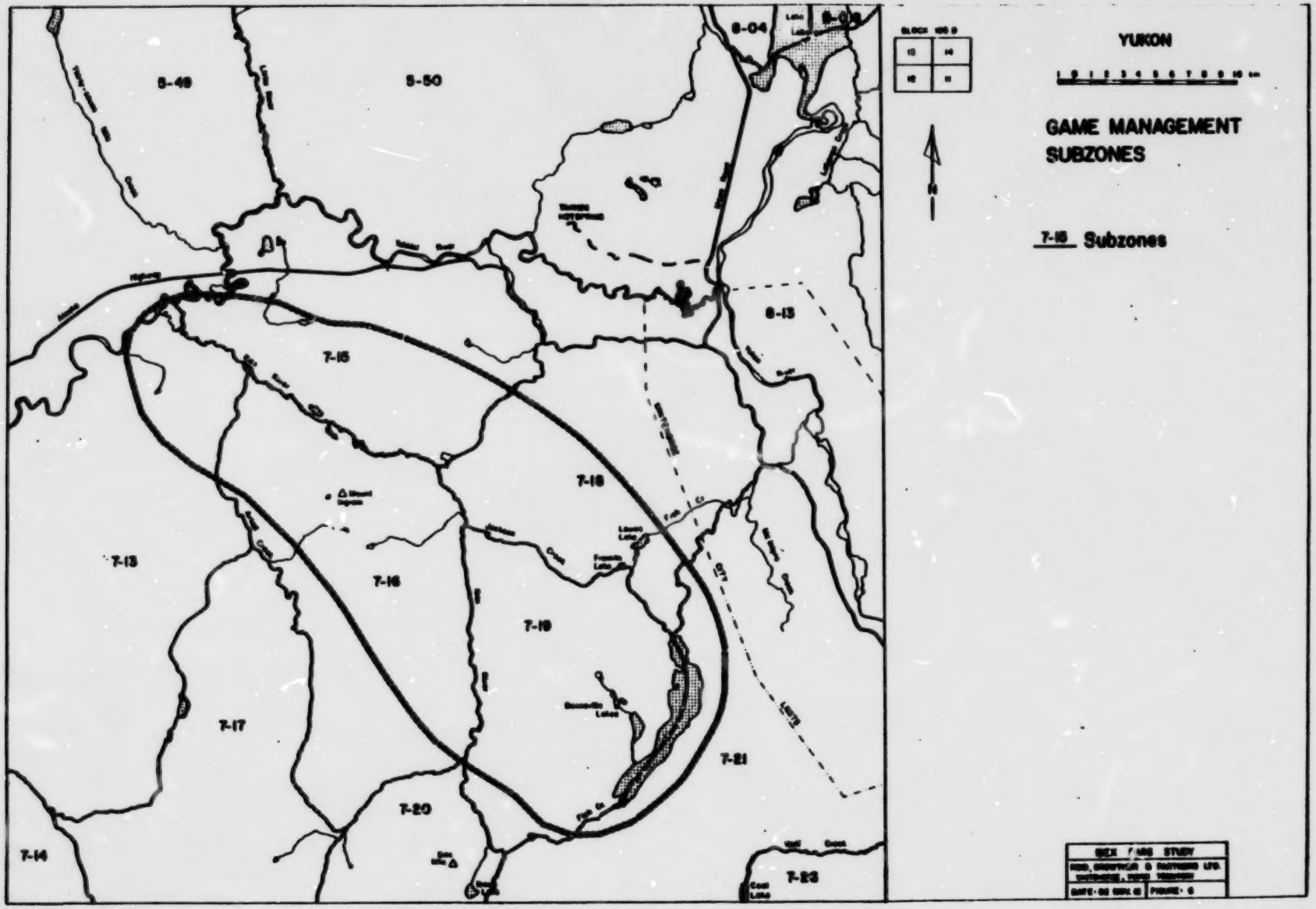
FIGURE: 8


YUKON
GAME MANAGEMENT
SUBZONES
7-15 Subzones
8-04
8-48
8-50
8-13
7-15
7-18
7-13
7-16
7-19
7-17
7-21
7-20
7-14
7-22

alpine, subalpine and boreal communities. The first of these is predominant at higher elevations with 1500 m (5000 feet) serving as an approximate elevational boundary although this can vary substantially with aspect and exposure. Within the study area, three alpine communities exist, two of which are characterized by a shrub layer of willow and birch. In moist conditions the understory is frequently dryas and grasses grading into dryas and lichen as the environment becomes drier. The former community is most likely to be found on seepage areas or on the lee side of slopes, while the latter occurs on areas subject to exposure or rapid soil drainage. As conditions become more severe, such as on very dry ridges and high slopes, the shrub layer disappears and the third alpine community of dryas, grass and lichen is found. It has been roughly estimated that one-quarter of the study area supports these alpine communities (refer to Figure 5).

The second group of communities is named subalpine and occurs as a transition zone between alpine and boreal communities. The environmental conditions become less severe with decreasing elevation and in response growth becomes greater (i.e., trees begin to occur) and species diversity increases. Willow and shrub birch are still dominant species in several subalpine communities although the ground vegetation varies with moisture. Wet sites will be characterized by grasses and sedges; rocky sites will support dryas. Lichens will be found on sites that have a variety of moisture conditions between very wet and very dry. In all these communities, other shrub and forb species will occur to some degree although they are unlikely to be major community components. Where conditions become favorable to tree growth, white spruce begins to appear and provides another series of subalpine communities. Other tree species such as lodgepole pine and paper birch may occur in conjunction with the white spruce. Willow and other shrubs are usually abundant in white spruce communities. The ground cover varies from feathermoss in mesic conditions to lichens on drier sites. A range of forbs may also accompany these communities.

Boreal vegetation communities occur at the lowest elevations in the study area (below approximately 900 m or 3000 feet) and are therefore concentrated in the valley bottoms and on the lower valley slopes. White spruce is a common tree with an understory ranging from feathermoss to very restricted growth. Lodgepole pine becomes a much more prominant tree and is the major component of a number of boreal communities.

Lodgepole pine communities may have a well developed shrub layer which is characteristically willow, although other species become notable as succession occurs. Occasionally lodgepole pine communities lack a shrub layer and instead have a lichen understory, as on rapidly to well-drained sandy or coarse textured soils commonly found on outwash, terraces and sand dunes. This community occurs in the Ibex River - Jackson Creek confluence area. On moderately well-drained sites feathermoss becomes the dominant ground cover. Although lodgepole pine communities can be stable on some sites, in many cases they are merely a successional stage to a white spruce community. The predominance of lodgepole pine communities in the north of the study area broadly along the Ibex River valley east to its junction with Jackson Creek is considered to be a result of the 1958 fire. Some original (i.e., pre-fire) pine and spruce stands remain and represent the most mature communities in the general burn area.

Two other communities which occur to a small extent in the study area are aspen poplar and willow/birch/bog moss. The first is noted to occur on steep southerly aspects of river channels and eskers, or on lacustrine materials following fires. This is the case in the study area as the community is primarily found on the south-facing bank of the Ibex River valley burn. The second community is characteristic of poorly to imperfectly drained depressions with organic soils and has a small presence in the northwest of the study area and at the southwest end of Fish Lake.

In the course of work carried out this far, limited information has been found regarding the existence of rare or endangered plant species within the study area boundaries. Rare plants, however, have been seen in the vicinity of Whitehorse and along the Alaska Highway by the Takhini River (Douglas et al., 1981) and if suitable habitat were present in the Ibex area, these plants could potentially occur.

Wildlife

Within the Ibex Pass study area and the immediate surrounding region, there is a high diversity of wildlife species and a number of sensitive habitat areas which should be recognized. While most of these species have been identified in other studies (n.b. Whitehorse North Land Management Project Report), additional information has been collected.

The major wildlife species present in the study area are listed in Table 2. The location of these animals and birds of prey are illustrated in a series of independent maps. The habitat requirements and concentrations of each species are briefly outlined in the text.

The dominant types of habitat utilized by wildlife in the study area include:

- floodplain - willow and deciduous plant communities
- old burns with extensive regeneration
- south-facing grassy slopes
- mature coniferous communities

The location of these habitats are in some cases as important to wildlife as specific vegetation communities. The diversity of these habitat types within the Ibex Pass study area creates many transition zones between the various vegetation communities which is sometimes important in sustaining wildlife populations. The subalpine zone and the riparian communities along the rivers and creeks appear to be the most utilized habitat in the study area.

TABLE 2

MAJOR WILDLIFE SPECIES
LOCATED IN STUDY AREA

Common Name	Latin Name
Beaver	Castor canadensis
Black Bear	Ursus americanus
Caribou	Rangifer tarandus
Coyote	Canis latrans
Dall's Sheep	Ovis dalli
Red Fox	Vulpes fulva
Grizzly Bear	Ursus arctos
Lynx	Lynx canadensis
American Marten	Martes americanus
American Mink	Mustala vison
Moose	Alces alces
Mountain Goat	Oreamnos americanus
Mule Deer	Dama hemionus
Muskrat	Ondatra zibethicus
River Otter	Lontra canadensis
Snowshoe Hare	Lepus americanus
Red Squirrel	Tamiasciurus hudsonicus
Weasel	Mustela ermines
Wolf	Canis lupis
Wolverine	Gulo gulo
Birds of Prey	
Golden Eagle	Aquila chrysaetos
Bald Eagle	Haliaeetus leucocephalus
Gyrfalcon	Falco rusticolus

Moose. The Moose (Alces alces) is primarily associated with upland willow/birch communities, lowland bogs, glacial and riparian communities and fire-created seral range (LeResche et al. 1974a)(1). Migrating within a limited range, the moose will utilize a combination of these habitats depending upon climate, availability, tradition and seasonal requirements (LeResche et al. 1974a)(1). In summer, moose usually feed in open areas and utilize the bordering shrub and forest communities for cover. In winter, their range is determined by the influence of climate on food availability and mobility (LeResche et al. 1973, Coady 1976)(1).

In the Ibex study area, moose distribution is limited by available forage. Primarily, the low rounded mountains from treeline up to 1524 m (5000') in elevation and the valley floors along the rivers or creeks are their preferred habitats. To date a number of surveys have been conducted in the fall and late winter in an attempt to determine critical range. Movements during summer months, however, have not been monitored within the study area.

In a regional context the moose population of the Ibex Pass study area is exceptionally high at certain times of the year. During late winter a number of areas represent important overwintering moose habitat. In the late autumn moose appear to be abundant in only one segment of the study area.

Select coverage of Game Management Zone 7 by Manfred Hoefs in the late winter of 1975 (refer to Figure 6), revealed a number of areas in Ibex which supported high moose concentrations. These include the Ibex Pass River valley, the southern end of the Ibex valley and the

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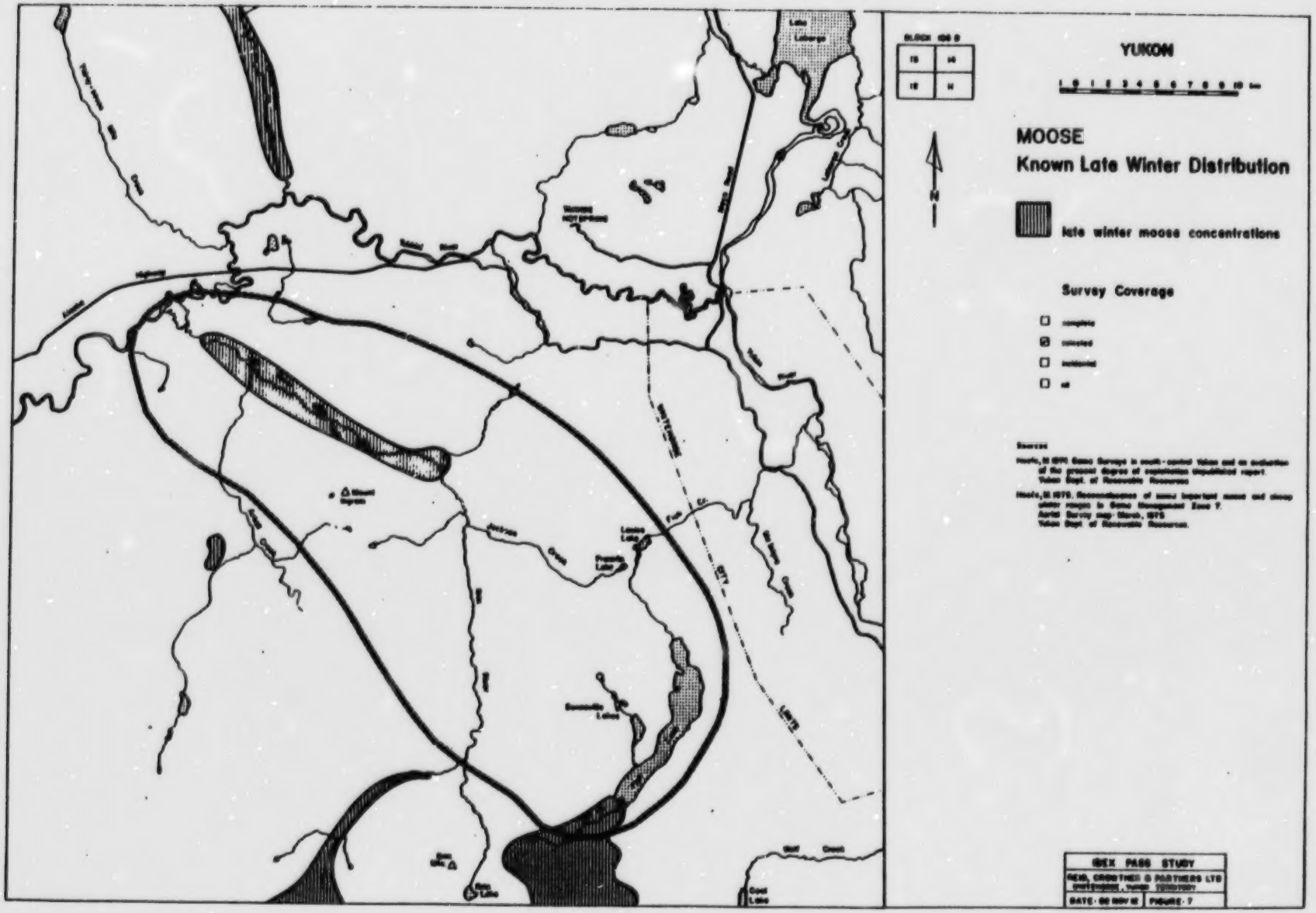
(1) Taken from The Terrestrial Habitat Evaluation Criteria Handbook. 1980. Published by the United States Fish and Wildlife Service.

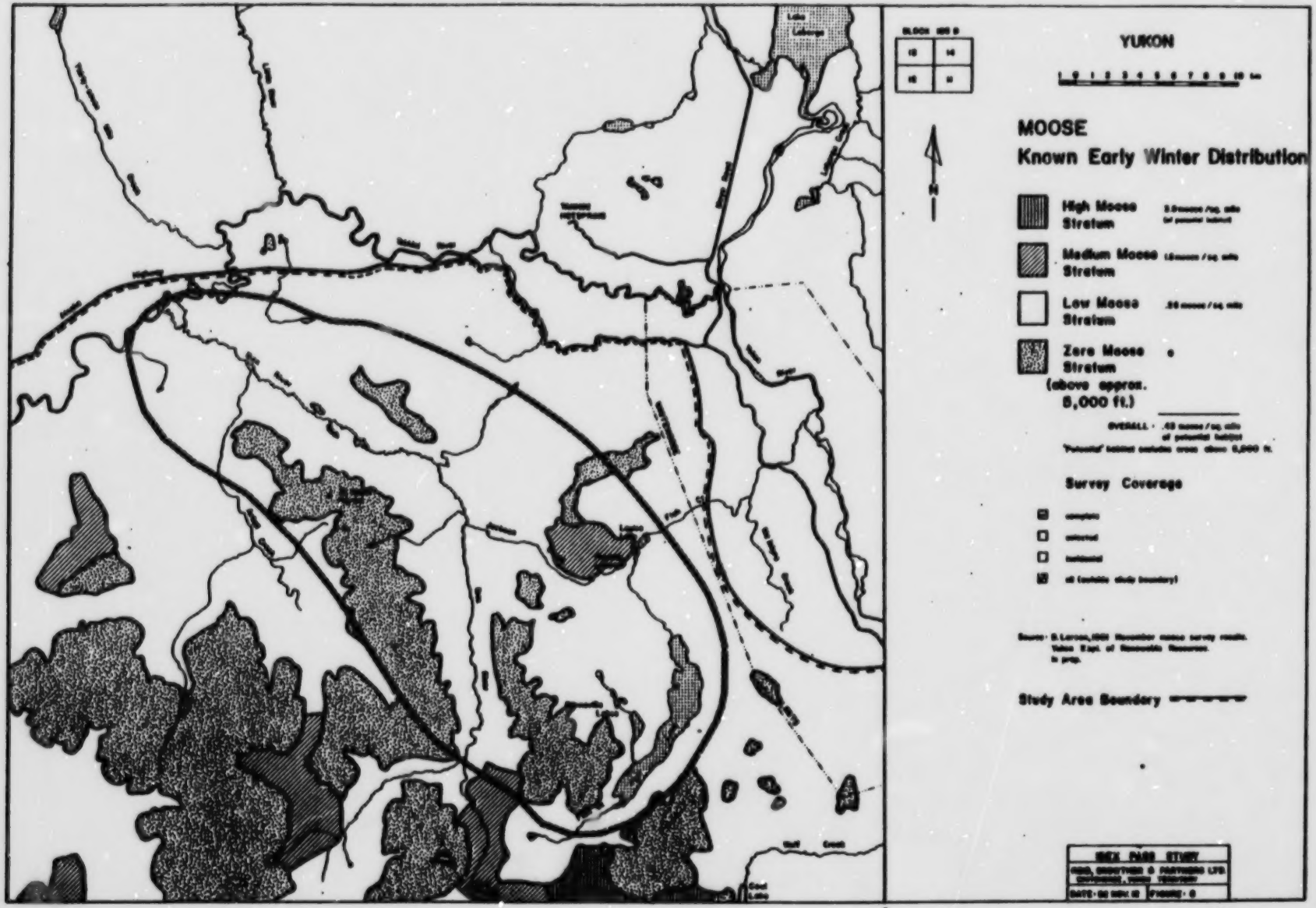
(2) Taken from The Terrestrial Habitat Evaluation Criteria Handbook. 1980. Published by the United States Fish and Wildlife Service.

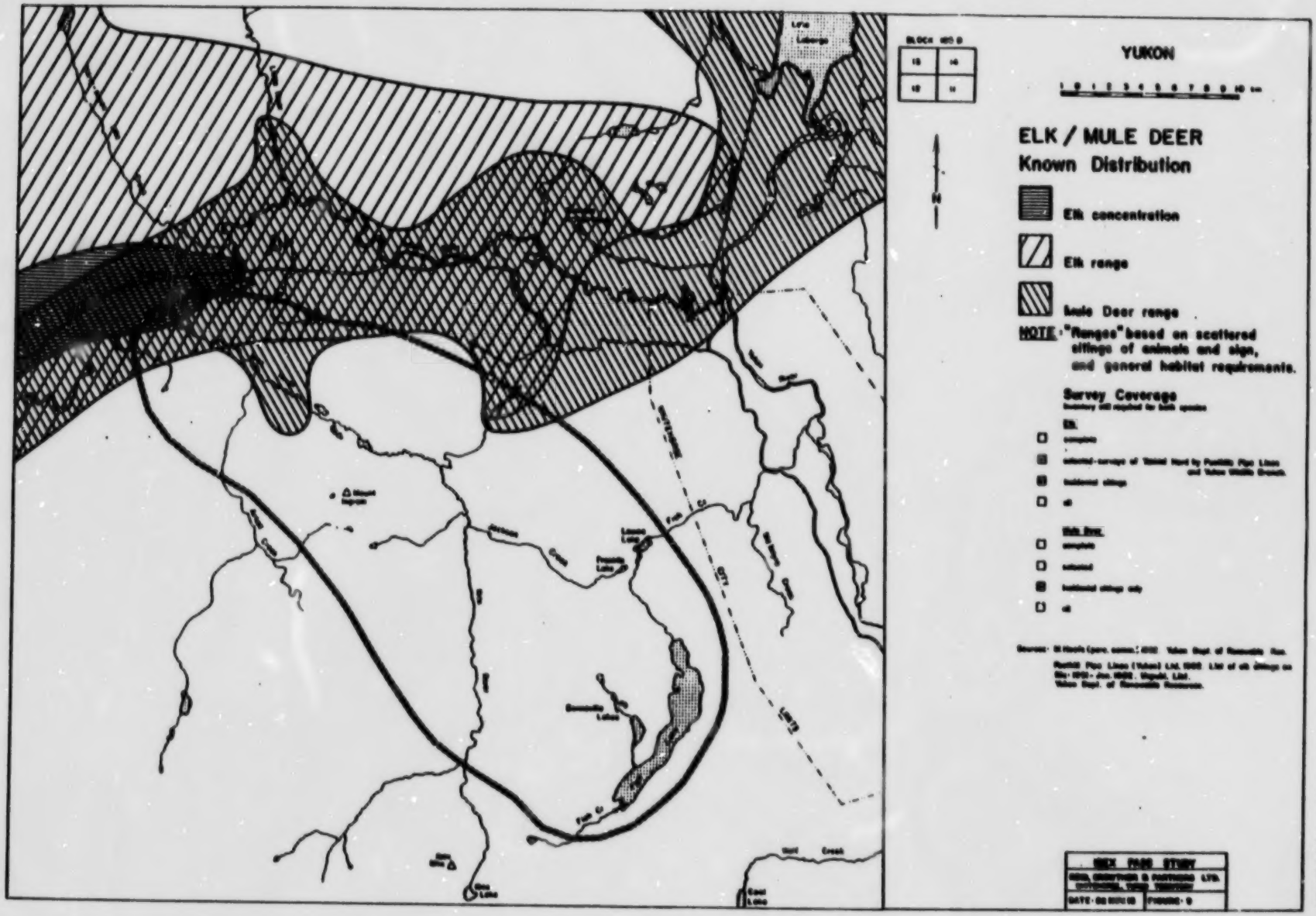
south end of Fish Lake. In addition, one other small concentration was identified at the head of Arkell Creek (Hoefs 1975) (refer to Figure 7). Regionally, these areas are very important in supporting overwintering moose populations.

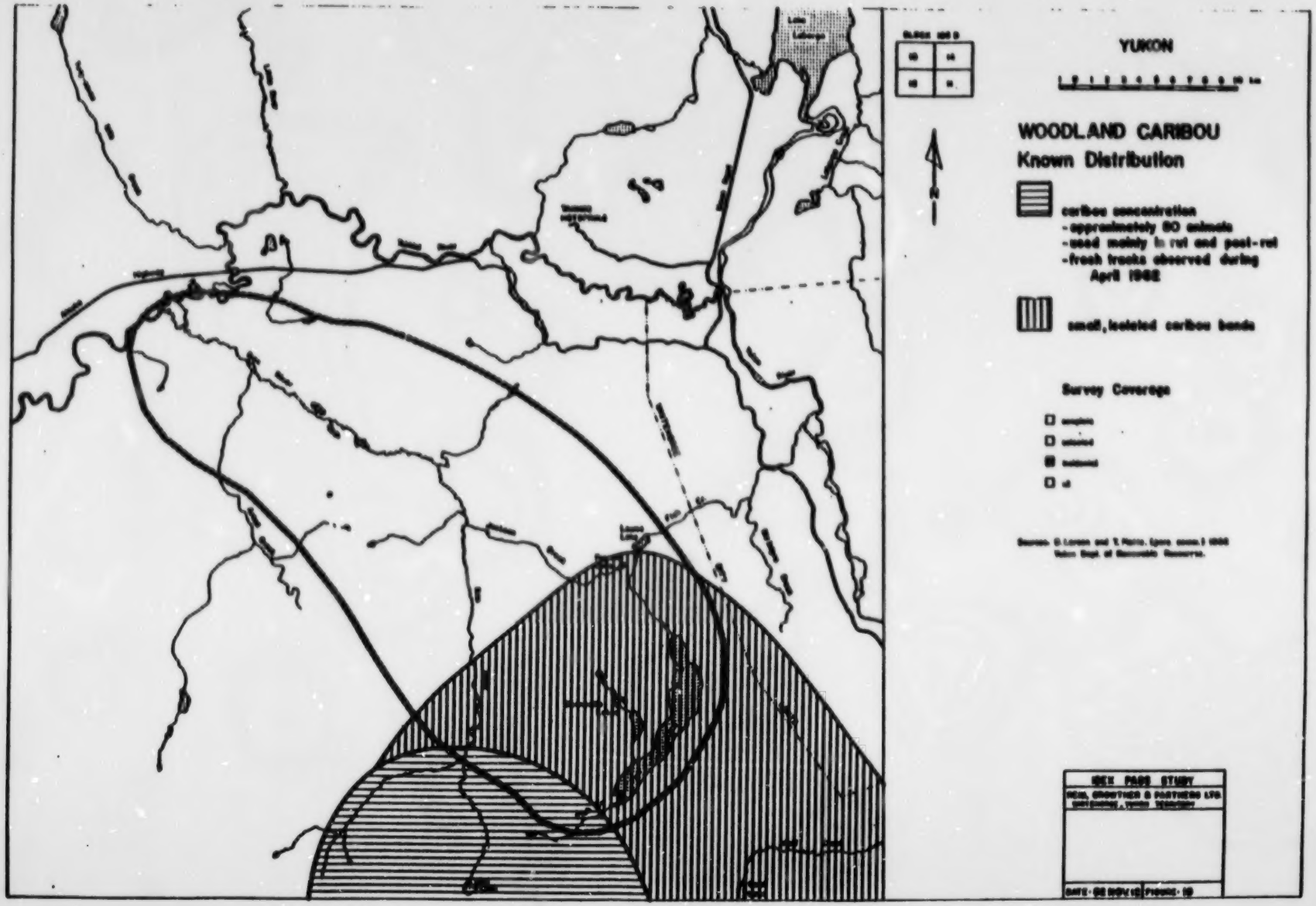
In the late autumn of 1981 a complete survey of the Ibex area was completed by Doug Larsen of the Yukon Wildlife Branch. Larsen identified the low lying areas south of Mount Granger as being the only region with a high percentage of potential moose habitat (in excess of 3.9 moose per square mile). Lower densities of 1.5 moose per square mile were determined on the north side of the upper end of Jackson Creek, the southern bottomlands (below 1524 m) of the Ibex River and around Ibex Lake and the southern end of the Arkell Valley. All other areas below 1524 m (5000 ft.) in the Ibex and surrounding region, yield low potential habitat with density estimates remaining at 0.25 moose per square mile. Above approximately 1524 m, the potential available moose habitat is zero (Larsen 1981) (refer to Figure 8).

Mule Deer. Mule deer usually prefer burned areas where poplar and pine regeneration has taken place. In addition, they are occasionally seen frequenting semi-open south-facing slopes (Hoefs 1982 - pers. comm.). In the study area their range has been determined on the basis of scattered sightings, various types of signs and specific habitat requirements. The mule deer sightings have been restricted to the area of the confluence of Arkell Creek and the Ibex River and the northwest side of Haskel Hill. Signs of mule deer as well as numerous sightings have occurred along the Takhini Hotsprings Road and the Aishihik powerline right-of-way northeast of the study area. To date no detailed research has been undertaken to determine the actual numbers, range or critical habitats of this species in the Ibex area (refer to Figure 9). In conclusion, the mule deer population located in the study area is probably quite high relative to most other regions of southwest Yukon. The fact that little information is available on it indicates the need for further studies.


YUKON
MOOSE
Known Late Winter Distribution
late winter moose concentrations
Survey Coverage
IBEX PASS STUDY


YUKON
MOOSE
Known Early Winter Distribution
High Moose Stratum
Medium Moose Stratum
Low Moose Stratum
Zero Moose Stratum
(above approx. 5,000 ft.)
Survey Coverage
Study Area Boundary


YUKON
ELK / MULE DEER
Known Distribution
Elk concentration
Elk range
Mule Deer range
NOTE: "Ranges" based on scattered sitings of animals and sign, and general habitat requirements.
Survey Coverage


YUKON
WOODLAND CARIBOU
Known Distribution
caribou concentration
- approximately 80 animals
- used mainly in rut and post-rut
- fresh tracks observed during April 1982
small, isolated caribou bands
Survey Coverage

Elk. These large ungulates frequent burn areas and are found in regions of dense poplar regeneration. Information on elk in the Ibex study area is limited and consists only of selected surveys of Takhini herd by Foothills Pipe Lines and incidental sightings by local residents[1]. The only known elk range in the study area is on the northern periphery (refer to Figure 9). Outside the northern boundaries of the study area, elk and mule deer populations overlap in their respective ranges.

As in the case of the mule deer, the elk population is extremely restricted within the Yukon. Consequently the preservation and proper management of this species, within the study area, is highly desirable.

Woodland Caribou. Unlike other regions of the Yukon, caribou populations in the Ibex Pass study area are small and geographically isolated (Russell 1982 - pers. comm.). These animals spend the majority of the winter months migrating varied distances in response to snow conditions and food availability. Survey coverage in the area consists of little more than a few incidental sightings. These isolated groups have only been reported in the southern region of the study area (refer to Figure 10).

One important characteristic of the woodland caribou is that they have the lowest recruitment rate of any ungulate in the Yukon (Foothills Pipe Lines (South Yukon) Limited 1979). This low recruitment rate, in combination with the fact that populations in the study area are small and isolated, increases their chance of extinction. As a consequence, hunting pressure must be carefully managed.

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(1) Foothills Pipe Lines (South Yukon) Limited. 1982. A list of all reported elk sightings on file 1951-Jan. 1982. (Includes company's own surveys and sightings by local residents.) On file at Yukon Department of Renewable Resources.

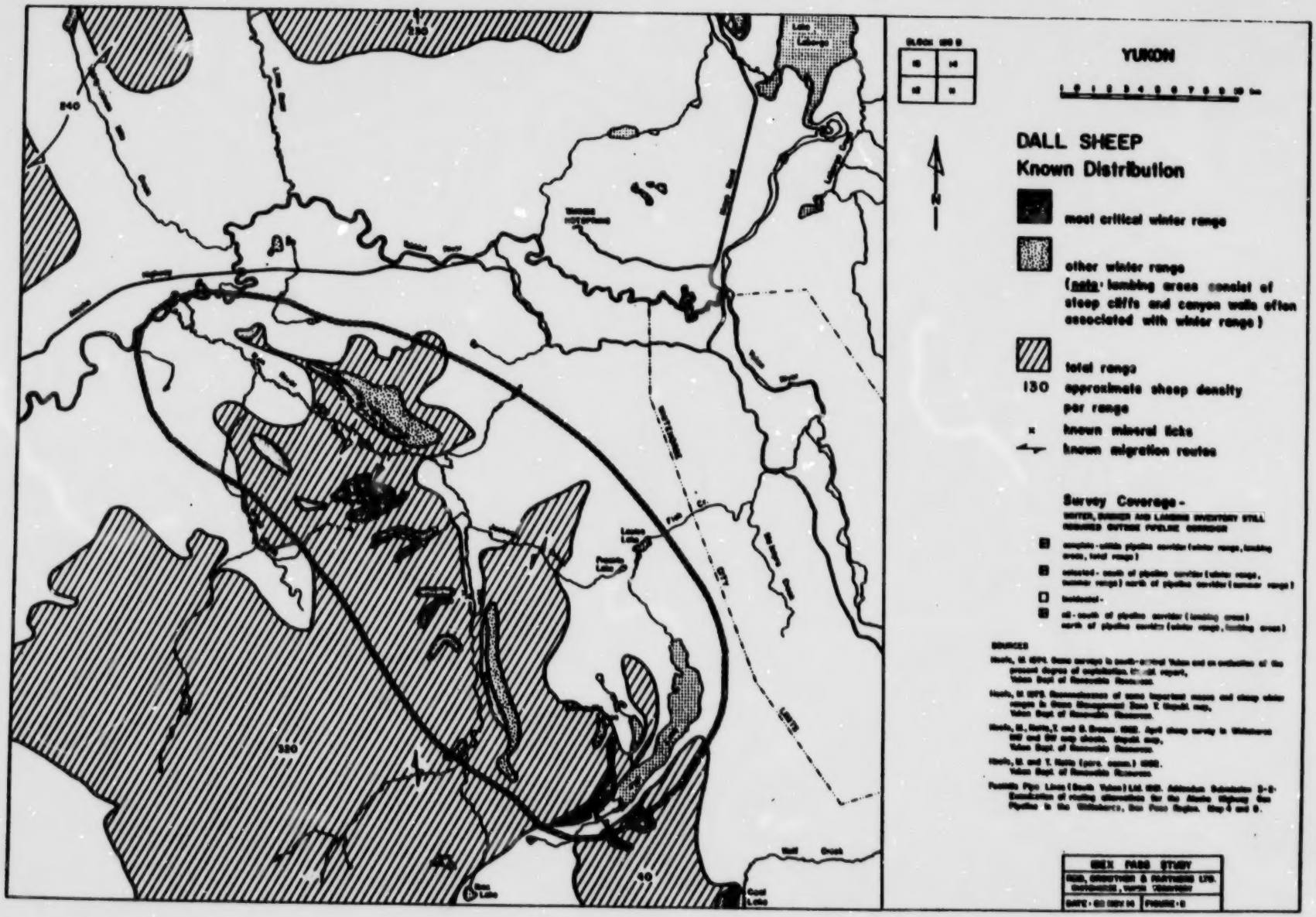
Dall Sheep. Except when mountain sheep migrate or visit mineral licks, their preferred habitat and range remains approximately above 1220 m (4000 ft.). At this elevation the animals traverse alpine meadows, plateaus and precipitous mountain slopes in search of food and protection against the elements.

Survey coverage of Dall sheep is only complete within the Ibex Pass area. Here, winter ranges, lambing areas and total range have been determined. Estimates run as high as 50 to 70 animals utilizing the slopes of Mount North Ibex year round with a further group of approximately 30 to 40 animals occurring on Mount Ingram to the south of the pass (Foothills Pipe Lines (South Yukon) Limited 1981). Compared to most other areas of the Yukon, these numbers are exceptionally high. In addition the Ibex Pass serves as a major migratory route for sheep moving between Mount North Ibex and the northern ridges of Mount Ingram (Hoefs, 1982 - pers. comm.).

Outside of this area the majority of the determined winter ranges, lambing areas and known mineral licks are a result of select survey coverage and reported observations by hunters and trappers (Hoefs 1974-75, Hoefs, Nette and Ereaux 1982). Consequently a more thorough survey coverage may reveal even more areas of critical habitat.

Other areas known to provide critical winter range for Dall sheep in this region are (refer to Figure 11).

- o isolated areas along the east and west ridges of the southern Ibex River valley;
- o the southeast and northwest facing slopes at the north end of Fish Lake; and
- o the eastern ridges located along the central section of the Ibex River valley.


YUKON
DALL SHEEP
Known Distribution
most critical winter range
other winter range
(note: lambing areas consist of steep cliffs and canyon walls often associated with winter range)
total range
130 approximate sheep density per range
known mineral licks
known migration routes
Survey Coverage -
SOURCES
GEX PARD STUDY

A number of mineral licks are known to occur along the northeast slopes of Mount North Ibex. Other licks are located along eastern slopes at the head of Arkell Creek and just south of the confluence of the Ibex River and Jackson Creek on the west side of the Ibex River (refer to Figure 11).

Migration routes are known to exist in three areas apart from the Ibex Pass. The most important of these is across the valley at the south end of Fish Lake. The importance of these migration routes and mineral licks cannot be underestimated in maintaining healthy sheep populations. Until a detailed study has been conducted, it will be impossible to ascertain the overall importance of each of these sites to the overall sheep population in the study area. One well documented fact, however, is that regionally, the Dall sheep population located within the Ibex Pass area is one of the largest outside of Kluane National Park.

Bear (Grizzly and Black). The low density, large movements and unique seasonal requirements make bear populations extremely difficult to manage. This is primarily due to the fact that the bear tends to select a mosaic of habitat types as opposed to just one. These habitats vary with the seasonal food requirements of the bears as well as their reproductive period. Densities are estimated to range between 30 and 40 square miles per bear in this region of the Yukon (Lortie 1977). More precise estimates cannot be developed without capturing a portion of the population. Habitat use patterns are described for the Kluane area by Pearson (1975) and by Miller et al. (1982) but may be of limited applicability given the difficult terrain types in the Ibex area (Smith - pers. comm. 1982).

Timber Wolves. The wolf is an elusive animal and avoids man whenever possible. In the Ibex study area, there is no information available regarding denning sites, habitat requirements or general movements. Trappers in the area have not recorded high wolf harvests; however, as a measure of population density this may not be a reliable indicator.

Regionally, wolves have come into conflict with a combination of domestic livestock and household pets. While concentrated primarily in the Takhini area, the combined problem of lack of prey and abnormal snowfall may trigger further problems. In the context of Ibex, it is important that proper planning is conducted in order to restrict the possibility of this occurring.

Furbearers. The most abundant furbearers found in the Ibex study area are: beaver (Castor canadensis), coyote (Canis latrans), red fox (Vulpes fulva), lynx (Lynx canadensis), mink (Mustala vison), muskrat (andatra zibethica), otter (Lutra canadensis), snowshoe hare (Lepus americanus), red squirrel (Tamiasciurus hudsonicus), weasel (Mustela erminea), timber wolf (Canis lupus) and wolverine (Gulo gulo). General information regarding the habitat requirements and life history of these animals in Yukon is provided in J. Rearden's Alaska Mammals.

The most important furbearers trapped on a regular basis in the Ibex Pass study area are: beaver, coyote, red fox, lynx, mink, muskrat, red squirrel, and wolverine. In a regional context the Ibex Pass study area supports high annual yields and as a consequence, it is considered an important fur producing area. The following is a brief synopsis of the general biology and importance of the five most sought after furbearers in the study area.

a) Beaver

The success of beaver populations in the Yukon varies with the overall quality of habitat. In regions with poor habitat, beaver colonies are smaller, litters are reduced and breeding begins at two years. In regions with good habitat, the beaver colonies are larger, litter size increases and sexual maturity may be delayed until four years (Rearden 1981).

The Yukon beaver is subjected to harsh winter conditions, being restricted under the ice for an average of seven months of the year. During this time the beavers are feeding on a maintenance budget only. Because of these factors beavers are more sensitive to disturbance in the north and take longer to re-establish themselves.

b) Muskrat

The wetlands in the Yukon are generally low in productivity and as a result the density of muskrats is low.

The presence of muskrats in the study is governed by water quality and the presence of suitable wetland habitat. Muskrats prefer marshland areas where aquatic vegetation is abundant and water depths range from between three and six feet. The northern muskrats also prefer living in bank dens and only build houses in order to extend their feeding range. During the winter months, muskrats feed on submerged vegetation. Any activity which inhibits the growth of submergents will affect muskrat distribution and abundance. Further information on the ecology and biology of the northwestern muskrat can be referenced in a recent paper by B.G. Slough (1982a).

c) Red Squirrel

The red squirrel is abundant throughout the study area. These animals are commonly found in forested habitat and reach their highest

densities in mature spruce forest especially along rivers (Banfield 1974). Any disturbance of this habitat from forestry or agricultural development can effectively eliminate the local squirrel populations.

d) Lynx

The number of lynx within the study area oscillate with the population cycle of the snowshoe hare. The lynx is more commonly found in habitat used by hares such as open mature coniferous forest, along the edges of burns and in areas of low lying shrub willow.

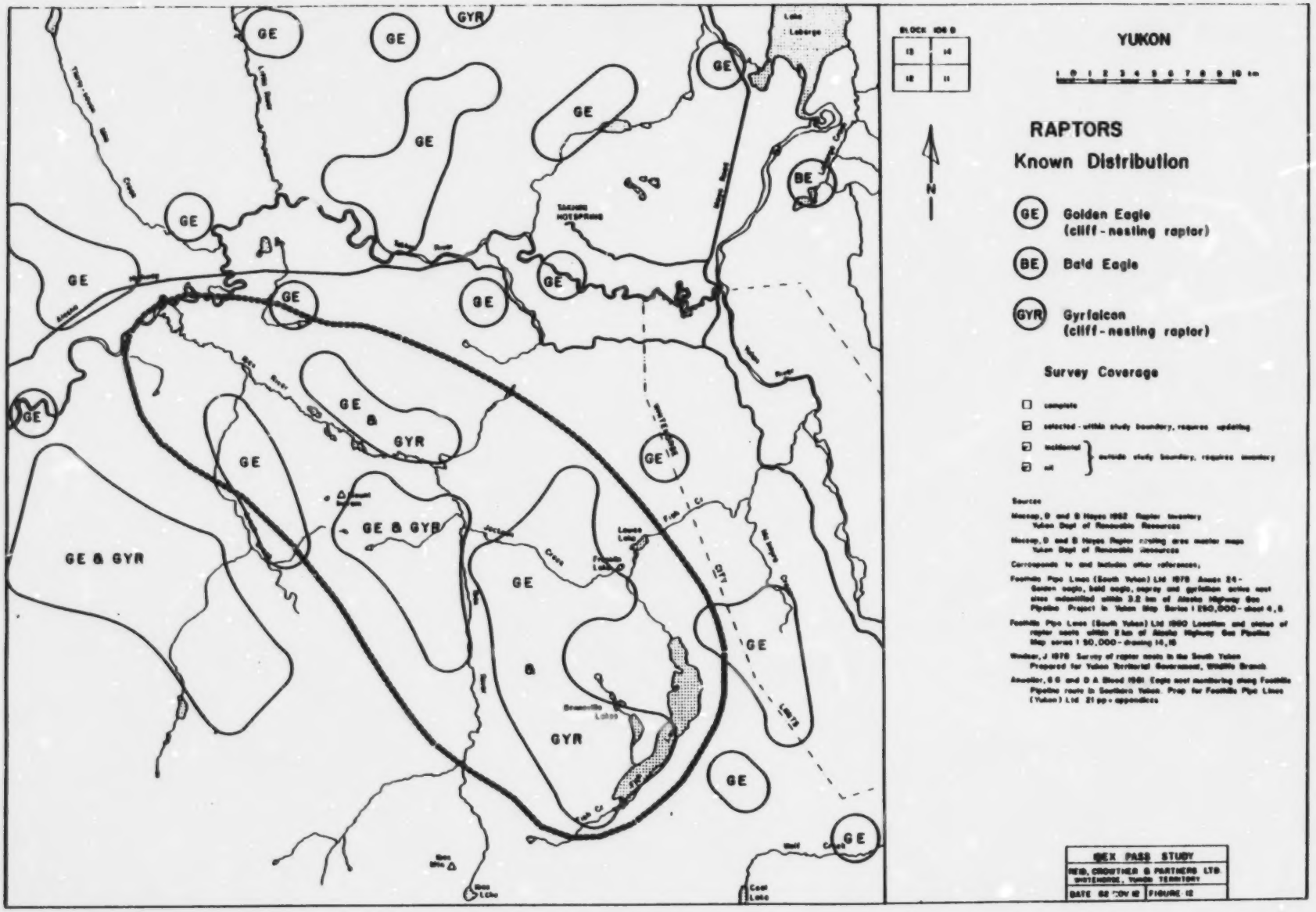
e) Wolverine

The Yukon is one of the last strongholds of wolverine in Canada. Unfortunately little is known about this elusive animal in terms of its habits or habitat requirements. The total density of the wolverine relative to southwest of Yukon or the study area is unknown (Slough 1982b).

Raptors. The Ibex study area contains some of the highest recorded golden eagle and gyrfalcon nesting densities in North America (B. Hayes 1982 - pers. comm.). Based on their population rarity, vulnerability and extreme value, these birds have been assigned management priority in the Yukon.

In the southern Yukon the most important habitat of these birds is below 1830 m (6000 ft.), in the mountain alpine and subalpine zones. Commonly referred to as cliff-nesting raptors, these birds quite often occupy large overlapping hunting ranges (Dave Mossop 1982 - per. comm.).

Information available on the accompanying Raptor Distribution Map (Figure 12) includes the most recent raptor inventory of the study


GE
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N
YUKON
RAPTORS
Known Distribution
Golden Eagle
(cliff - nesting raptor)
Bald Eagle
Gyrfalcon
(cliff - nesting raptor)
Survey Coverage
complete
selected - within study boundary, requires updating
outside study boundary, requires inventory
Sources
GEX PASS STUDY
REID, CROWTHER & PARTNERS LTD
WHITEHORSE, Yukon TERRITORY
FIGURE 12

area completed by the Department of Renewable Resources during the spring and summer of 1982. In addition this research material has been supplemented with earlier data provided by Foothills Pipe Lines (1978, 1980, 1981).

The most important habitat of these cliff-nesting raptors is along the ridges of Mount Ingram and the south-facing slopes of Mount North Ibex. In addition a wide range extends along the east side of the central portion of the Ibex River valley as far south as the north end of Fish Lake. With the exception of these ranges, the only other areas with a high concentration of gyrfalcon and golden eagle nest sites lie to the southwest and northeast of the study area.

Wetland Birds. The only sites in close proximity to Ibex with important staging areas for waterfowl, are the south end of Lake Laberge and the lower reaches of the Takhini River. The Upper Laberge wetlands are a known spring and fall staging area for whistling swans, the rare trumpeter swan as well as many other types of waterfowl and shorebirds (Dennington 1982 - pers. comm.)

There have been a number of wetland bird surveys conducted in the study area. The overall productivity of any given site has been quite low (Dennington 1982 - pers. comm.). The only other major use appears to be in the fall of the year, when the Ibex Pass acts as a migration corridor for many large waterfowl (D. Mossop 1982 - pers. comm.).

Upland Game Birds. The important game birds in the study area are spruce grouse, ruffed grouse, willow ptarmigan, rock ptarmigan and white-tailed ptarmigan, rock ptarmigan and white-tailed ptarmigan. The ecological importance of these bird species in maintaining both raptors and carnivorous furbearers is poorly documented.

In the study area the willow ptarmigan is known to overwinter in large numbers in the subalpine shrub around Fish Lake. Additional information regarding population sizes or regions of concentration for this and other game species is unavailable.

In a regional content the game birds located in the study area are very important to local hunters. Easy access into many areas especially the Bonneville Lakes, provides excellent game bird hunting most of the year.

Aquatic Inventory

During the summer of 1980 limnetic and fisheries information was collected by the Inventory Section of the Resource Planning Branch, Department of Renewable Resources. This inventory analysis was completed using the Aquatic Information System developed by the Aquatic Studies Branch in British Columbia. While generally remaining too site specific for many aspects of this study, certain elements have been incorporated into the text, especially the general information on known fish distribution (Davies 1980). Individuals interested in obtaining more precise information than that recorded on the Aquatic Inventory Map (Figure 13), should contact the Resource Inventory Section, Department of Renewable Resources.

Fisheries

The Yukon River is the only drainage system associated with the Ibex study area. The total number of fish species known to occur within the study boundaries is eight, of which all are considered to be important for economic, ecological, aesthetic or scientific purposes. A summary of the fish species present within the study area is provided in Table 3. General information regarding the habitat requirements of each of these species is outlined below. Precise information regarding the location of many of these habitats is not known.

TABLE 3

FISH SPECIES KNOWN TO OCCUR IN THE IBEX PLANNING AREA

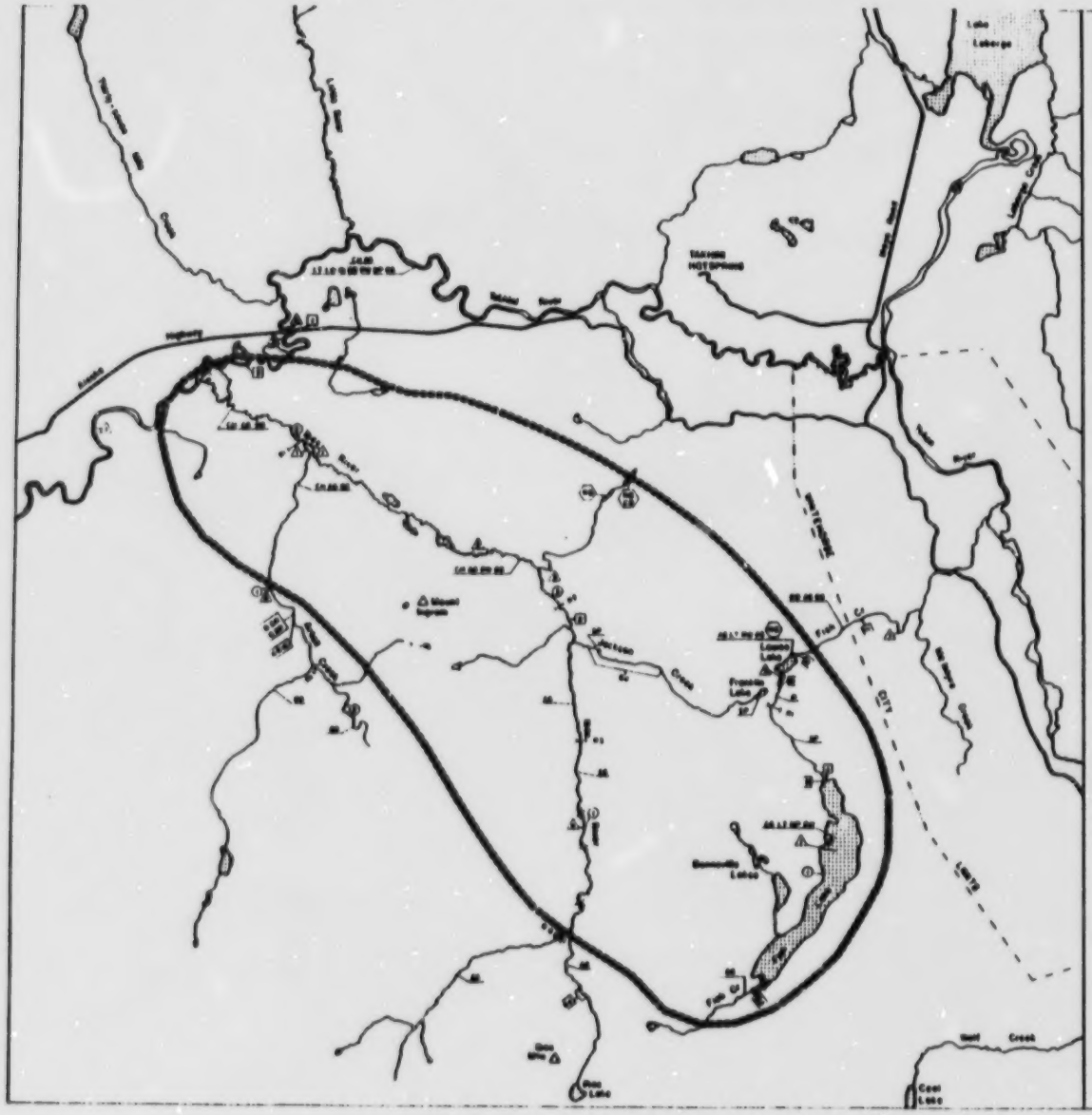
Common Name	Scientific Name
Chinook Salmon	*Oncorhynchus tshawytschs*
Coho Salmon	*Oncorhynchus kisutch*
Lake Trout	*Salvelinus namaycush*
Rainbow Trout	*Salma gairdneri*
Arctic Grayling	*Thymallus arcticus*
Round Whitefish	*Prosopium cylindracem*
Northern Pike	*Esox lucius*
Slimy Sculpin	*Cottus cognatus*

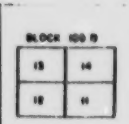
Chinook Salmon. This species like all types of Pacific salmon is anadromous, hatching in fresh water, spending part of its adult life in the ocean and eventually returning to freshwater to spawn. Each female deposits anywhere from 3,000 to 14,000 eggs in several gravel nests which she excavates in relatively deep moving water. The eggs usually hatch during the winter months or early spring. The newly hatched fish live in the gravel for several weeks before migrating to quieter areas of the spawning rivers as well as small tributaries. In the study area, at the end of their second year, the young Chinook migrate to sea (Scott and Crossman 1973).

The only Chinooks known to occur in the study area are in the Ibex and Arkell rivers (refer to Figure 13). The importance of these rivers in terms of spawning and rearing habitat is unknown (Roxborough 1982 - pers. comm.).

Coho Salmon. In the study area the coho salmon are landlocked and do not respond to the normal life cycles of their anadromous counterparts. When introduced to a lake as fry, the young become territorial, remaining in pools and slow water for the next two years. In the third year, they would normally migrate back to the Pacific and remain there for two years before returning to freshwater (McPhail and Lindsay 1970). Since these are landlocked their chances of survival beyond the second year is minimal.

The only coho known to occur in the study area are in Scout Lake (refer to Figure 13). These are the result of intensive stocking programs in 1975 and 1977 in which 19,000 and 6,000 fry were introduced. The success rate of this stocking program is unknown. It is expected that these populations have already expired.





YUKON

AQUATIC INVENTORY

AQUATICS BIOPHYSICAL

CH CHINOOK SALMON
CO COHO SALMON
RB RAINBOW TROUT
LT LAKE TROUT
LW LAKE WHITEFISH
IN INCONNU (SHEEFISH)
AG ARCTIC GRAYLING
NP NORTHERN PIKE
BB BURBOT (LING)
RW ROUND WHITEFISH

OS INDICATES KNOWN BUT NON-SPORT OR NON-COMMERCIAL SPECIES
SP INDICATES FISH OBSERVED BUT NOT IDENTIFIED
⊖ INDICATES FISH NOT DETECTED AT TIME OF SAMPLING

REACH BOUNDARY & REACH NUMBER
MAN MADE DAM
BEAVER DAM
5m HIGH, 200m LONG ZONE OF ROCK CASCADES
PERSISTENT DEBRIS ACCUMULATION
FORD
SITE NUMBER WITH BIOPHYSICAL DATA AVAILABLE
WATER QUALITY-
WATER QUANTITY- SAMPLING SITE NUMBER

PLANTED SPECIES

SOURCES

Davies, D 1980 Southern Lakes Inventory

Davies, D NOV 1982 Personal Communication
Inventory Section Resource Planning Branch
Department of Renewable Resources Whitehorse

Yukon Land and Resource Inventory
Whitehorse Map 105 D

Swetzer, 1971 Report on rainbow trout planting program

Walker, et al, 1973 Rainbow trout planting and lake survey program

Canada, Fisheries and Marine Service, 1976
Yukon fisheries resources catalogue

BREX PASS STUDY	
REID CROWTHER & PARTNERS LTD WHITEHORSE, YUKON TERRITORY	
DATE 82 NOV 17	FIGURE 13

Arctic Grayling. Grayling are ubiquitous throughout the study area. The preferred habitat of this species is the clear water of rivers, creeks and lakes. The grayling spawn from early May to mid-June in small clear streams, large rivers and along lakeshores, over a grave or rocky bottom. During late fall, the grayling migrate into larger rivers and lakes where they overwinter. Grayling are primarily surface feeders and do not constitute a competitive threat to other fishes. Growth and sexual maturity is extremely variable with spawning occurring anytime after the fourth year (McPhail and Lindsay 1970).

Grayling have been caught in both the upper and lower reaches of the Ibex River and in Fish Lake (Davies 1981) (refer to Figure 13). Assuming the fact that grayling are generalist feeders and survive in a number of different habitats, they are probably common in most of the study area.

Lake Trout. This fish species is the largest of the true freshwater fish and while preferring large, deep, cold lakes it is often found in large rivers (McPhail and Lindsay 1970). As the lakes and rivers begin to cool in the fall, the lake trout begin looking for broken rock or rubble areas along the sublittoral zone. Spawning typically occurs when the water temperature reaches 10°C. The trout fry spend several years hiding in the rubble of the bottom. The small fish grow extremely slowing and will not begin to spawn until after their sixth or seventh year (Scott and Crossman 1973).

The only lake trout known to occur in the study area are located in Fish Creek (Davies 1981) (refer to Figure 13).

Rainbow Trout. Rainbows occur in both an anadromous and non-migratory form. The migrating variety, however (known as "steelheads") have not been found in the study area. The non-migrating variety are a result of stocking programs and are not known to occur naturally in the study area. The preferred habitat of the non-migratory adults is in moderately deep freshwater lakes; however, they are commonly found throughout river systems. Spawning occurs during late winter or early spring over the shallow gravel riffles of tributary streams. The parent fish are usually three years of age or older and rarely spawn more than three times (Scott and Crossman 1973). Lake Louise (Jackson Lakes) was one of the first recipients of the stocking program and now report spawning in other areas of the Fish Creek and Porter Creek drainages. Present fisheries regulations do not permit the stocking of lakes which are not land-locked and as a consequence, no additional stockings have taken place in these lakes.

Scout Lake, which is landlocked, has been continually stocked with rainbow trout since 1971 by the Department of Fisheries and Oceans. In 1971 a total of 3,750 rainbow fry were released followed by an additional 1,000 in 1973. In 1975, a 5.8 kg (12.7 lb.) rainbow was caught, indicating the success of the stocking program. During the summer of 1982, another 10,000 rainbow fry were introduced into the lake (Department of Fisheries and Oceans 1982 pers. comm.). The overall intent of these stocking programs is to enhance the sports' fishery.

Northern Pike. The pike frequents shallow lakes and bays as well as quiet rivers within the study area. Pike spawn during the early spring following ice breakup. The young fish hatch within 12 to 14 days, but little is known of their life history. The pike is piscivarious, feeding primarily on smaller fish (Scott and Crossman 1973).

Pike are only known to occur in Fish Lake; however, they are probably found in most lakes in the study area (refer to Figure 13).

Round Whitefish. The whitefish is an important component in the food chain of the aquatic community, serving as prey for many predatory fish species. Round whitefish spawn in the late fall following a decline in water temperature. The gravel bottoms of the upper reaches of rivers and streams is the preferred spawning habitat. Little is known about the habitat requirements of developing fry (Scott and Crossman 1973).

Adult round whitefish have been observed in the lower reaches of the Ibex River and in Louise and Fish lakes. Similar to certain other fish species in the study area, the round whitefish is likely quite common in many other locations.

Slimy Sculpin. The slimy sculpin is found in most water sources. Predominantly a bottom dweller, the sculpin is often overlooked in terms of its ecological importance. While rarely noticed by fishermen because of its small size, the sculpin represents an important food source to the larger piscivores.

In a regional context the only species of fish which is highly sought after in the study area is the rainbow trout. The chinooks are not open to fishermen and most other fish species are commonly caught throughout the region. The amount of fishing pressure on Fish Lake or the Jackson Lakes in comparison to other lakes outside the study area is unknown.

LAND USE

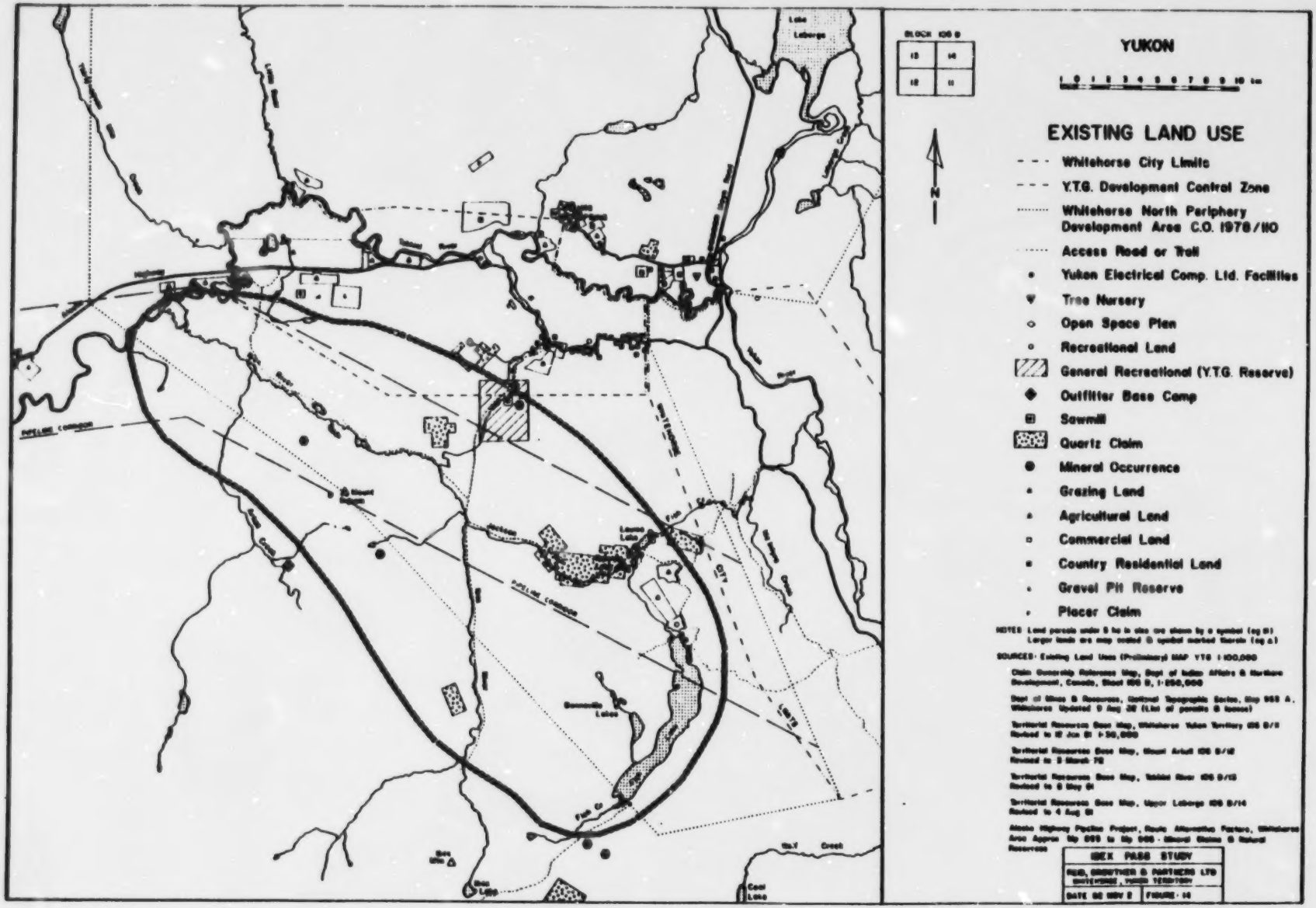
Man has utilized the study area on an intermittent basis for an extended period of time. Evidence to date of prehistoric use indicates that predominantly the Ibex Valley, Jackson Lakes and Fish Lake were utilized. Land uses have now become more diversified; mining

claims, grazing lands, institutional, residential and recreation uses have been added to those traditionally associated with hunting, trapping and fishing. Notwithstanding this increased diversity, the present landscape reflects a relatively low intensity of use.

Relatively recent circumstances which created substantial areas of residential, grazing, agricultural uses or proposed uses along the Alaska Highway and within the City of Whitehorse limits have not affected this area to the same extent. However, certain nodes of activity especially in the Jackson Lake and Fish Lake area, reflect certain land use demands.

At the present time there may be a disparity between land use demands which truly exist and those which are understood from current levels of use in the area. This situation arises because a large portion of the land within the study area has been withdrawn from normal disposition and held on reserve awaiting decisions on the final routing to the proposed Alaska Highway Gas Pipeline Project as proposed by Foothills Pipe Lines (South Yukon) Limited. Under the Territorial Lands Act, a corridor reserve of 4 km on either side of the pipeline centre line was established in October 1977 (P.C. 1977-2859); however, in the Ibex area this reserve area takes into consideration all possible routing alternatives and affects all of the study area except for the southwestern edge and south portions (refer to Figure 14).

Restrictions in effect on this reserve corridor include the withdrawal of lands for disposition except for instances when the land might be required for disposal of quarry materials. Order-in-Council P.C. 1977-2860, issued in October 1977, pursuant to section 93 of the Yukon Placer Mining act, prohibits entering land within the pipeline reserve for purposes of locating a claim or prospecting for gold or other precious metal without the permission of the Minister of DIAND (Redpath 1979). Thus, the emplacement of this reserve has possibly given rise to an artificial picture of land use and land use pressures


YUKON
EXISTING LAND USE
Whitehorse City Limits
Y.T.G. Development Control Zone
Whitehorse North Periphery Development Area C.O. 1978/110
Access Road or Trail
Yukon Electrical Comp. Ltd. Facilities
Tree Nursery
Open Space Plan
Recreational Land
General Recreational (Y.T.G. Reserve)
Outfitter Base Camp
Sawmill
Quartz Claim
Mineral Occurrence
Grazing Land
Agricultural Land
Commercial Land
Country Residential Land
Gravel Pit Reserve
Placer Claim
SOURCES: Existing Land Uses (Preliminary) MAP YTG 1:100,000
Claim Ownership Reference Map, Dept of Indian Affairs & Northern Development, Canada, Sheet 105 D, 1:250,000
Dept of Mines & Resources, Surveys & Topographic Series, Map 96B A, Whitehorse Updated 9 Aug 72 (List of parcels & leases)
Territorial Resources Base Map, Whitehorse Yukon Territory 105 D/11 Revised to 12 Jan 81 1:50,000
Territorial Resources Base Map, Mount Arkell 105 D/12 Revised to 3 March 72
Territorial Resources Base Map, Tabbet River 105 D/13 Revised to 6 May 81
Territorial Resources Base Map, Upper Laberge 105 D/14 Revised to 4 Aug 81
Alaska Highway Pipeline Project, Route Alternative Factors, Whitehorse Area Approx Mp 893 to Mp 900 - Mineral Claims & Natural Reserves
IDEX PASS STUDY
DATE 82 NOV 2
FIGURE 16

in the area. Keeping this fact in mind, the following sections describe land use activities.

Land Use History

There are few records to indicate the history of land use in the Ibex Pass study area. The apparent absence of historical remnants suggests limited use of the Ibex area up until quite recently.

However, while the history of this area remains quite sparse, a great amount of historical information has been documented about the Whitehorse area. This information centres on two distinct periods of history; the gold rush in the early 1900's, and the construction of the Alaska Highway in 1942.

The Klondike gold rush travellers utilized two main routes, the Yukon River and the Old Dawson Trail, in their scramble to reach Dawson. In the early 1900's the Yukon River was used by steamboats. A Northwest Mounted Police post and telegraph line office were located on the west bank of the Yukon River just south of Lake Laberge.

Passengers in stagecoaches utilized the Old Dawson Trail to reach Dawson. The route generally followed the Takhini River to its tributary, the Little River, and then proceeded northwest.

Of much greater significance to the evolution of accessibility to this area was the construction in 1942 of the Alaska Highway. This was a strategic war construction project that completed the Alaska Highway in less than one year. For the most part the route followed the overland transportation routes which developed in response to the gold rush and trading. These routes included the Dawson Trail and the Chisana Trail. The Alaska Highway became the main transportation route from which access roads could be directed into the Ibex area as demands for mining, forestry, hunting, trapping and recreational types of land use gradually developed.

Prehistoric Resources

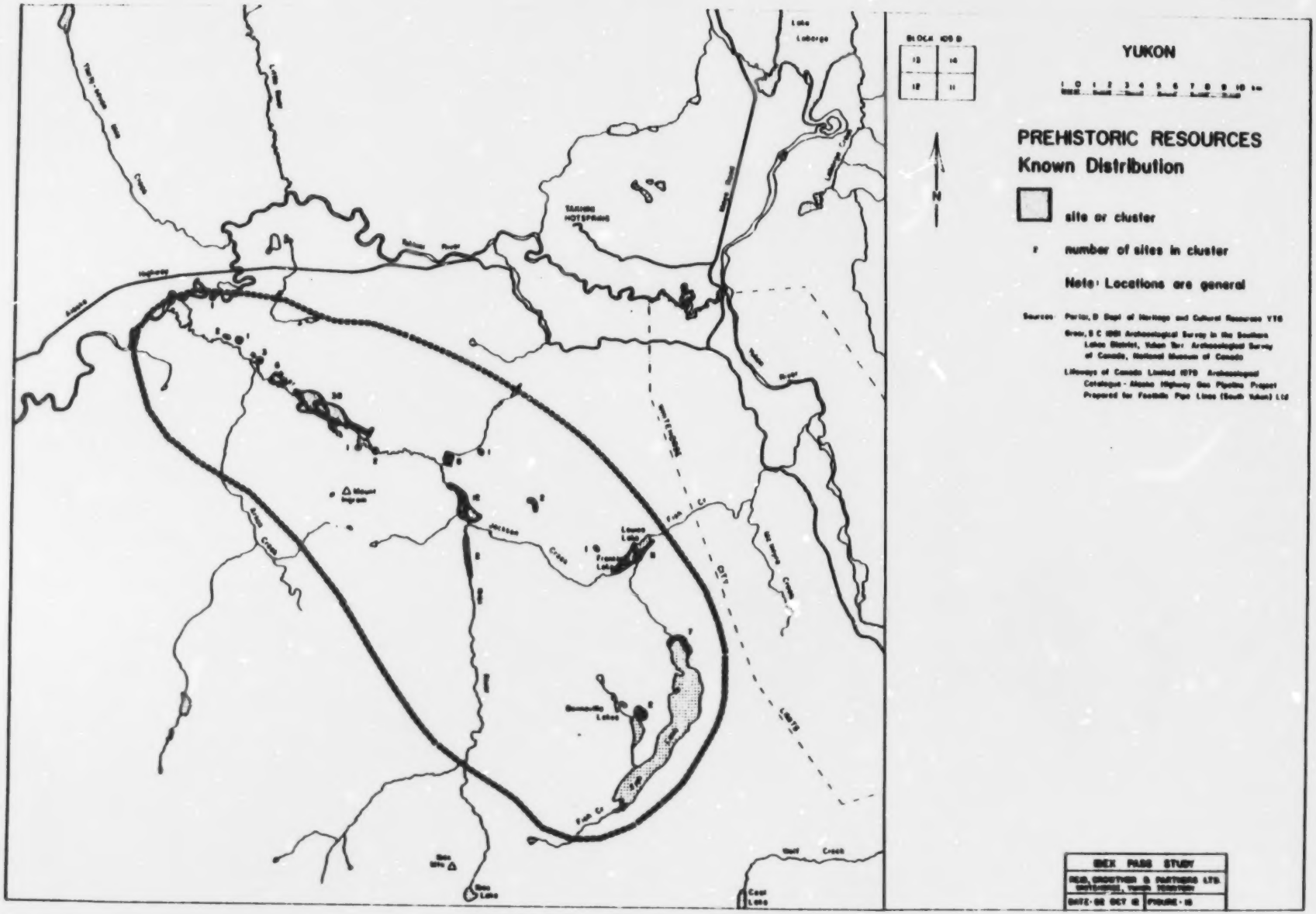
The heritage resources which have been identified are all dated during the time period prior to the entry of white man into the Ibex region in the late 1800's. They represent the evidence left by nomadic native groups travelling according to their subsistence land based economy of hunting, fishing, collecting and trapping.

The degree of importance of the prehistoric resources has not been clearly established. However, an initial inventory of the numbers of sites present has been identified. These sites have been located through an examination of paleotopographic features, animal distribution patterns and native knowledge of good camping sites (Greer, pers. comm. 1982). Verification of sites was accomplished from on-site surveys.

This initial inventory has been primarily focussed on the Ibex River valley, Franklin Lake and Louise Lake area and Fish Lake due to a particular need for assessment of the potential impact of the Foothills Pipeline, if it followed the Ibex valley route. This archaeological work was completed by Lifeways of Canada. It has been supplemented by field work completed by Sheila Greer working for the Yukon Department of Renewable Resources. Other parts of the study area have undergone very little examination.

The majority of the 101 prehistoric sites found in the study area were located in the Ibex River drainage (refer to Figure 15). Here 76 sites were located. Most of these prehistoric sites were on river terraces and were associated with water. The density of material suggests heavy utilization of the Ibex Pass at some (undated) time in the past (Lifeways of Canada, 1979). Estimates of the age of these sites range from 8000 to 200 years ago (Lifeways of Canada, 1979).

Almost all of the remaining sites were also closely associated with water. Two of the three sites found along the Takhini River were campsites (Lifeways of Canada, 1978). Twelve sites were situated in the


YUKON
PREHISTORIC RESOURCES
Known Distribution
site or cluster
number of sites in cluster
Note: Locations are general
Sources:
BEX PASS STUDY

Franklin Lake area. Findings included a native bush camp (Lifeways of Canada, 1979). Fish Lake (including Bonneville Lakes) yielded an additional nine sites. One site contained early occupation artifactual material which was of particular interest (Lifeways of Canada, 1979).

The frequency of sites located gives very little insight into their importance unless some assessment of the sites' particular value can be made. Prior to detailed evaluation of the significance of each site, approximate indicators of value have been placed on these sites by Lifeways of Canada. In general the Takhini River, Ibex drainage area, and Franklin sites range from low to moderate value, while the Fish Lake area sites ranged in value from low to high (Lifeways of Canada, 1979: 76, 77, 79, 82, 84, 85, 87, 88).

Land Disposition

We noted in Chapter I (Land Administration and Land Use Planning) that the federal government controls all land dispositions occurring in the Ibex study area whether a lease, lease agreement, or sale agreement is concerned.

Apart from the mining claims and sawmill lease all existing dispositions are concentrated in the Fish Lake and Louise/Franklin Lake areas (refer to Figure 14). Table 4 and accompanying information was prepared in 1980 as part of the inventory background for the Whitehorse North Periphery Planning Study. Table 4 outlines the status of dispositions on April 1, 1980.

On the east shores of Fish Lake there are two residential recreational leases at 0.09 ha and 0.103 ha. Seven surveyed lots averaging 0.10 ha and one YTG campground reserve at 0.44 ha are now below the present water level. Immediately north of Fish Lake are two titled lots and one reserved lot from 1.0 ha to 1.34 ha. Northeast of these lots are three surveyed lots which have been cancelled and remain under federal control.

TABLE 4

DISPOSITIONS
FISH LAKE AND LOUISE LAKE (JACKSON LAKES) AREA

Status of Dispositions	Number	Size Range (ha)
Titled lots	11	0.27 - 1.19
Surveyed lots (underwater)*	7	
Vacant - YTG	4	0.079 - 0.34
Vacant - Federal	3	
Residential/recreational lease	2	0.09 - 0.103
Religious lease	1	2.5
Grazing lease	2	142.0 - 323.7
Reserves (utilities)	7	0.27 - 4.03
Reserve (YTG campground) (1 covered by water)	2	0.44 - 2.97

Survey completed April 1, 1980

* Underwater as a result of water storage for hydro development.

Source: Whitehorse North Periphery Planning Study
Volume 1, Part 2 Inventory

Between Fish and Louise Lakes there are two grazing leases of 142 ha and 323.7 ha and one reserved lot on Fish Creek of 1.41 ha.

Near the southern shore of the smaller lake in the Louise Lake system are two reserves of 0.27 ha and 11.50 ha. Two titled lots, of 0.37 ha and 0.48 ha, and one religious lease of 2.5 ha are located on the shores of this lake as well (refer to Figure 14).

At the north end of Louise Lake is the Louise Lake subdivision consisting of 12 lots, ranging from 0.09 ha to 0.24 ha, of which eight are titled properties and four are vacant lots transferred by Order-in-Council (P.C. 1968/336) in 1968 to the Government of Yukon. Another utility reserve of 3.75 ha is located in this area as well as a YTG reserve of 2.97 ha for a campground.

Other dispositions are not so clearly defined due to conflicting information sources. A Yukon Territorial Government Recreational Reserve surrounding the Scout Lake area is still in existence.

A group of quartz claims are located southwest of Louise Lake. A single quartz claim is located just west of the Ibex River and east of the summit of Mount Arkell (refer to Figure 14). The remaining two claims are situated southwest of the Scout Lake area.

Information sources for the sawmill site and cutting areas show significant variation in both location and status (refer to Figure 14).

Residential Use

Although a substantial number of vacant (19) and mixed use lots (4) exist which could have the potential for residential development, only two "residential" lots exist and of these only one is actually used as a residence (the other residential site beside Franklin Lake is used for recreational purposes). The single family residence is

located near the north end of Fish Lake. The resident lives here year-round, operates traplines and has a lease for grazing horses.

Access and Transportation (Public)

Access routes originating from the Alaska Highway enter the study area on either the north or east edges. The shortest route from Whitehorse is a well-maintained gravel road which connects Louise and Franklin lakes as well as Fish Lake to Mile 919 of the Alaska Highway between Porter and McIntyre creeks. Yukon Electric maintains this road for access to its facilities at the lakes (refer to Figure 14).

Two other access roads exist. Some portions of these roads are difficult to navigate with four wheel drive types of vehicles at certain times of the year. The first route begins at Mile 934 on the Alaska Highway and proceeds in a southerly direction to Scout Lake. Beyond the lakes, the road deteriorates but does continue to the junction of the Scout Lake valley with the Ibex River, where it connects to a trail along the river. This route continues in a northwesterly direction along the north side of the Ibex River for approximately fifteen kilometres, returning to the Alaska Highway at Milepost 945, the second access post. These routes are not maintained although the sawmill operator near Scout Lake may perform minor improvements.

All of these access routes are closed during the winter months and travel may be difficult during inclement weather. The first road access from Milepost 919 provides snowmobile and cross-country skiing. Off-road access is possible for those on foot or horseback during the warmer months and for those on snowmobiles or cross-country skis during winter. These activites tend to be more concentrated in the eastern portion of the study area, but exact patterns are not known. The most important of these is the Coal Lake road and the numerous spur roads developed by Whitehorse Copper. The degree of access by helicopter or float plane is unknown.

Mining

Minerals play an important role in the economy of the Yukon Territory and they are therefore a necessary component to address within the context of the Ibex study. According to mineral resources mapping (Archer, Cathro and Associates 1981) no producing mines or former producers, commercially important or significant deposits exist in the Ibex study area. Just beyond the study boundary, bordering on the eastern edge, is a northwest trending zone of mineralization known as the Whitehorse Copper Belt. Based on present information, however, this zone does not extend into the study area.

More specific mineral information was obtained through examination of the Claim Ownership Reference Map (February 1982) and accompanying Index and the Federal Leases Map (August 1982). The Claim Ownership Map indicates the most active areas in terms of minerals although other sites may be under exploration. (A permit is not required for prospecting.) Once prospecting activity indicates reasonable mineral potential, the claim is likely to be recorded and thereby maintained for one year. The present number of quartz mining claims in the study area are judged to represent some degree of interest in minerals in the Ibex region (refer to Table 5 for lease expiry dates of current claims and information on which minerals occur). In the recent past there has been interest in the northern portion of the study area on the northeast side of the Ibex River (Foothills Pipe Lines (South Yukon) Limited 1979); however, these quartz claims have lapsed. Additionally, one placer claim was illustrated on this updated map although it is not currently held. Placer mining interest at present appears minimal although, as with quartz claims, prospecting may occur without a permit so actual activity is not necessarily reflected in the index of claims.

The Yukon Quartz Mining Act and the Yukon Placer Mining Act allow activities that have a direct effect on the surface disposition of

TABLE 5

MINERAL OCCURRENCES IN IBEX STUDY AREA

Occurrence Name (may represent grouping of claims)	Minerals		Lease Expiry
	Major	Minor	
Harniak (claims LMH 1-8)	Cu,Ag	Au	18 July 83
Jackson - numerous claims	Cu	Fe	16 April 82 - 13 Sept 83
Ingram - no leases at present	Ag,Zn Pb	Cu	N/A
? Al 1-8, 13 - 16, 20, ED 24 FR	N/A		1 June 83-1 June 84 23 Aug 83
Suits (numerous claims)	Cu,Mo	W	28 May 82
Fish Lake	Coal		N/A
Luscar	Coal		N/A
Top (top 1-8)	Cu, Pb, Zn, Ag		2 Mar 86
Ramming (1-48)	U		N/A
Untill	N/A		N/A

land. For example, a residence may be constructed on a placer claim and is not disallowed on a quartz claim (WMLMPP 1979).

The ownership of a claim also entitles the owner to surface rights which normally would be included in a land use permit, such as driving a vehicle across the land, digging ditches, creating campsites and so on. He also has the right to clear his claim without a permit. A prospector engaged in testing can remove up to 25 cords of fuelwood per year without a permit.

Other mining activities which may be present in the study area are rock quarrying and coal extraction. According to the Federal Leases Map, Parks Canada holds a lease for a rock quarry near Franklin Lake (refer to Table 4). South of the Ibex Pass study area and possibly extending into it, interest in the coal resource has been expressed and it is thought that a lease may be pending for Whitehorse Coal, a company that has constructed access to Coal Lake. Mineral leases (as opposed to claims) are more formalized and allow the leasee tenure for a 21 year period provided at least $500 in exploratory work or payment in lieu has been made, a legal survey approved and other procedures completed (DIAND 1981).

Power Production

In March 1952 Yukon Hydro (a subsidiary of Yukon Electric) was granted a water power license by the Water Resources Branch of Environment Canada. This license which is valid until October 31, 1986:

> allowed Yukon Hydro the right to divert the flows of Fish and Porter Creeks, to store water in Fish and Louise Lakes (which raised the water level 3 m and 18 m respectively) and to generate and transmit power. This licensed the construction of power station No. 1, control gates, spillways, dams, penstocks and a transmission line. Six lots in the area (no's 279-284) were reserved to Yukon Hydro for the development of this project (Whitehorse North Periphery Planning Study, Vol. I, Part 1).

Water is stored in Fish Lake, a dam and control gate permitting regulation of water along Fish Creek. Three lots are held by Yukon Hydro at the north end of Fish Lake for the control gate. Before this water enters Louise Lake, it is connected to the spillway from Franklin Lake. At the junction of the spillway and Fish Creek, Yukon Hydro has Lot 279 reserved for the organization.

Two earth filled dams and a vertical sluice gate control are present at Louise Lake and the smaller lake nearby. Yukon Hydro has two lots reserved at this location.

A dam, penstock and powerhouse are located outside the study area on Fish Lake road. Hydro power is generated for use by the City of Whitehorse. Yukon Electric continues to own and operate the Fish Lake Hydro system.

Agriculture

Due to constraints of poor soils and climatic limitations, commercial agriculture is not a feasible proposition in the Whitehorse region at this time. The main agricultural land use is the production of animal feed either through forage or grazing.

North of the Ibex study area, an arc of agricultural land use extends along the Takhini River. The best soil capability for agriculture is rated as Class 4 at the junction of the Ibex and Takhini rivers. The rest of the agricultural land is Class 5 or lower. At the regional level a concentration of grazing land is found on either side of the Alaska Highway between Milepost 935 and 940.

Within the Ibex study boundaries agricultural land use is very limited; there are no areas used for forage production and two areas are used for grazing horses. These latter sites of 142 ha and 323.7 ha are situated between Fish and Louise Lakes (refer to Figure 19) and are formalized as two leases.

No new dispositions of land for agricultural or grazing purposes have been made since 1975 when a moratorium was put into effect by the federal and territorial governments. Therefore, current land use for agriculture has not altered since 1975. It is possible that seasonal residents of the Ibex study area located near Louise, Franklin and Fish Lakes could grow vegetables for home consumption although the extent of this activity is likely minor if it exists at all.

Forest Resources

The current use of the forest resources is not well documented. The white spruce/feather moss communities which are found up the southeast slope from the Scout Lake valley and south along the Ibex River after its junction with Jackson Creek represent some of the best spruce timber growth in the study area according to the height classes as defined on the ELS map. Most trees are in the 7.6 to 17.5 m range. These areas are also reasonably accessible for timber harvest thereby explaining the presence of the sawmill in the Scout Lake valley. This sawmill operation run by Roger Kneller is believe to cut rough timber for sale to local markets (Whitehorse North Periphery Planning Study 1979). At the present time it is understood the sawmill is situated approximately 1.5 km down the Scout Lake road and not in the location indicated on the Federal Leases Map, although at one point it was situated farther down the Scout Lake valley. Cutting has taken place along the valley and is a seasonal operation.

In addition the Yukon Territorial Government has indicated that individual cutting activity occurs along the Scout Lake road. This activity concentrates on standing fire killed timber from the 1958 burn and is used as fuelwood. Several other areas also supply this material to homeowners and commercial woodcutters as indicated on Figure 5 by the presence of access roads. Information on volumes taken and exact supply areas is incomplete although a permit is issued free of charge to any resident to cut 90 m^3 stacked (25 cords) of fuelwood for his own use. As access tends to be the limiting factor, quantities of wood removed from areas other than the Scout Lake valley are likely small.

Under terms of Territorial Timber Regulations, an individual may obtain from the Resource Management Officer (RMO) in his district, a permit to cut trees on Crown land for such mining-related purposes as cabin construction, timbering for a shaft or fuelwood. He has the right to clear his claim without a permit and to dispose of the wood in whatever non-commercial manner he sees fit. A prospector engaged in testing at various sites can cut up to 25 cords of fuelwood per year without a permit (Northern Affairs Program 1981). The exent of this use of the forest resources in the Ibex area is unknown.

In a regional context the overall potential for fuelwood in the Ibex is minimal. Exploitation of the resource over the last few years has reduced its volume along the easily accessible routes. Future consideration may have to be given to removing the firekill in the more inaccessible areas such as along the south side of the Ibex River.

Recreation

Traditionally the Ibex region has provided a conveniently located recreational area for Whitehorse residents, with the most concentrated zone of use being the southeastern side of the study area. Throughout the remaining area use is of a more dispersed nature.

Recreation participants are generally local families or small groups employing individual vehicles on established access routes. The major exception to this summary would be non-local groups of hunters taken into the area by the local guide. Recreationists partake in one or a combination of the following range of outdoor pursuits: sightseeing, wildlife viewing, back-packing, trail riding, boating, fishing, hunting, camping or cottage use. Cross-country skiing, snowmobiling and ice fishing are winter recreational activities (WNLMPP 1979) favoured in the area concentrating on the east side.

The eastern quater of the study area contains the relatively more concentrated activities represented by fishing, boating, camping

and cottage use. Fishing is popular in Louise and Franklin lakes which are stocked with rainbow trout. These lakes, in addition to Fish Lake, are locally known for Arctic grayling and lake trout sport fishing (LUIS 1973). Louise and Fish lakes are favoured for boating and camping. Although the Yukon Territorial Government campground at Louise Lake is not longer operated by the Department of Renewable Resources, informal camping still exists in this location and in the vicinity of Fish Lake. Several cottages (or residences used as cottages) are found in this part of the study area. They are located on Louise Lake (1), Franklin Lake (2), and Fish Lake (4). Two of the cottages on the eastern shores of Fish Lake are held by squatters.

The north and west portions of the study area support more dispersed recreational use such as trail riding, backpacking and hunting although they are access-dependent. Trail riders originate at both the Sky High Ranch near Fish Lake and the Ski Chalet near Whitehorse. Routes currently used for this activity are not known but would enter the study area to some extent. Backpackers and hunters are considered dispersed users but these groups gain access to the Ibex region in a limited number of ways: hunters are known to use the Louise Lake route since it approaches better hunting areas further into the mountains (WNLMPP 1979). Backpackers may use the same route because it is one of the more convenient. The Scout Lake route also provides reasonable access.

Another area which may serve as a node for recreational activity in Scout Lake. The Yukon Territorial Government has set aside a Recreational Reserve on Scout Lake for the Yukon Scout Council (refer to Figure 14). In addition this area serves as an important recreational spot for fishermen since rainbow trout stocking programs began in 1970.

Hunting, Trapping and Outfitting

Hunting. The entire Ibex planning area is located in Game

Management Zone 7 and is subdivided by zone 7-15, 7-16, 7-19. Table 6 outlines the present hunting schedule which governs these subzones.

Hunting regulations in the Ibex study area are determined by the abundance of a given species. In the event that a population becomes depleted from natural or man-induced hunting pressures, the subzone is closed. In the Ibex planning area, wildlife surveys have only been conducted on moose, elk, caribou (incidental) and mountain sheep. Hunting regulations regarding other harvestable wildlife stem from studies which have been conducted in other areas.

Trophy and sport hunting is very important in the Ibex study region. The close proximity of the Ibex area to Whitehorse attracts hunters. With the exception of anterless moose, caribou, mountain goats, mule deer, elk and spring grizzly, all other big game species are hunted on a seasonal basis. Likewise, all upland game birds and small game are hunted either seasonally or year-round (refer to Table 6).

Table 7 indicates the total number of moose and Dall sheep harvested by resident hunters between 1978-80. While these values provide information on the total number of animals shot, they do not indicate the number of recreational hunter days spent in the area. This value, while being hard to precisely determine, is mainly regulated by:

- o proximity to communities
- o road access
- o known rates of hunter success
- o general economic times

(Nette 1982 - pers. comm.)

Trapping. There are presently four trapping areas which impinge to varying degrees on the study area. These are trapline #283 owned by Ed Bowman; #286 owned by Walter Smith; #287 owned by Larry Barrett and #924 owned by Sylvia Williams (refer to Figure 16). All of these traplines are currently active and considered productive (Slough 1982 - pers. comm.).

TABLE 6

RESIDENT HUNTING SCHEDULE IN GAME MANAGEMENT ZONE 7
1982-83

Types of Game	Species	Limits	Season Dates and Closures
Big Game	Antlered Moose	one	Aug 1 - Oct 31
	Antlerless Moose	N/A	Closed
	Caribou	N/A	Closed
	Mountain Sheep	one	7-15; 7-18-Closed 7-16; 7-19 - Aug 1 - Oct 31
	Mountain Goat	N/A	Closed
	Grizzly Bear (spring)	(one)	Closed
	Grizzly Bear (fall)	(one)	Sept 1 - Oct 31
	Black Bear (spring)	(one)	Apr 15 - June 15
	Black Bear (fall)	(one)	Aug 1 - Oct 31
	Wolf	no limit	Aug 15 - June 15
	Coyote	no limit	Aug 1 - Mar 31
	Wolverine	one	Aug 1 - Oct 31
Migratory Birds and Upland Game Birds	Spruce Grouse	daily 10	Sept 1 - Nov 30
	Ruffed Grouse	possession 30	Sept 1 - Nov 30
	Blue Grouse	daily 5	Sept 1 - Nov 30
	Sharptailed Grouse	possession 15	Sept 1 - Nov 30
	Ptarmigan	daily 10	Sept 1 - Jan 31
	Migratory Birds (Ducks, Geese, Rails, Coots and Snipe)	possession 30 (varies with species)	Sept 1 - Oct 31
Small Game	Snowshoe Hare	no limit	Apr 1 - Mar 31
	Arctic Ground Squirrel	no limit	Apr 1 - Mar 31

Prepared by the Wildlife Management Section, Yukon Department of Renewable Resources

TABLE 7

RESIDENT MOOSE AND DALL SHEEP HARVEST 1978-80

Game Management Subzone	Moose			Dall's Sheep		
	1978	1979	1980	1978	1979	1980
7-15	3	4	1	closed	closed	closed
7-16	1	6	1	5	N*	N
7-18	11	1	7	-	N	N
7-19	4	8	8	1	N	N
TOTAL:	19	19	17	6		

Information provided by Wildlife Management Section, Yukon Department of Renewable Resources

*N - not available

Table 8 outlines the total harvest of these four trapping areas between 1977 and 1981. The total number of lynx taken have increased substantially during this period. Other trapped species have fluctuated on a year to year basis with overall harvest numbers reaching their peak in the 1979-80 season.

Harvest rates are strongly linked with the economic value of the individual species. Table 9 outlines the total dollar value received from fur harvests in these four trapping zones. The total number of lynx harvested has increased dramatically while their value has remained high, relative to other species. In 1978-79 the total estimated value of lynx was approximately $22,700.00 with a total harvest of 66 animals. In 1980-81 this value had increased to over $40,000.00 with a total harvest of 140 animals. No other predator in the study area has had such a high pelt value or such an increase in trapped success. This high rate of harvest is a function of both increased trapping pressure and an increase in the abundancy of prey (due to the increase in the numbers of snowshoe hare).

Trapping effort also plays an important role in regulating the number of animals taken each year. On the one hand, the beaver is easy to trap but its low value reduces the desire to trap it. The wolf on the other hand is difficult to trap and although valuable, is not economically worth the effort to trap it. Trapping effort is also regulated to a limited degree by native traditions, which may place heavy emphasis on the trapping of species such as beaver, muskrat and squirrel.

Outfitting. The only big game guiding area within the boundary of the study area is #17 (refer to Figure 16). The rights to operate in this region are currently owned by Klaus Heynen. Geographically the study boundary represents only a small portion of Heynen's entire guiding area. The fact that it lies in the heart of his western section, however, increases its importance (refer to Figure 17). The statistics available on non-resident hunter harvests and non-resident

TABLE 8

TOTAL HARVEST OF TRAPPING AREAS
283, 286, 287 and 294
BETWEEN 1977-1981

	1977-78	1978-79	1979-80	1980-81
Bear	-	-	-	-
Beaver	8	25	40	7
Coyote	4	8	6	6
Fox (coloured)	4	3	6	5
Lynx	22	66	81	140
Mink	5	-	6	12
Marten	2	1	-	-
Muskrat	41	23	119	-
Otter	-	-	11	-
Squirrel	25	82	342	115
Weasel	-	-	6	-
Wolf	-	1	-	1
Wolverine	1	1	1	2
TOTAL	112	210	618	288
(minus Lynx)	90	144	537	148

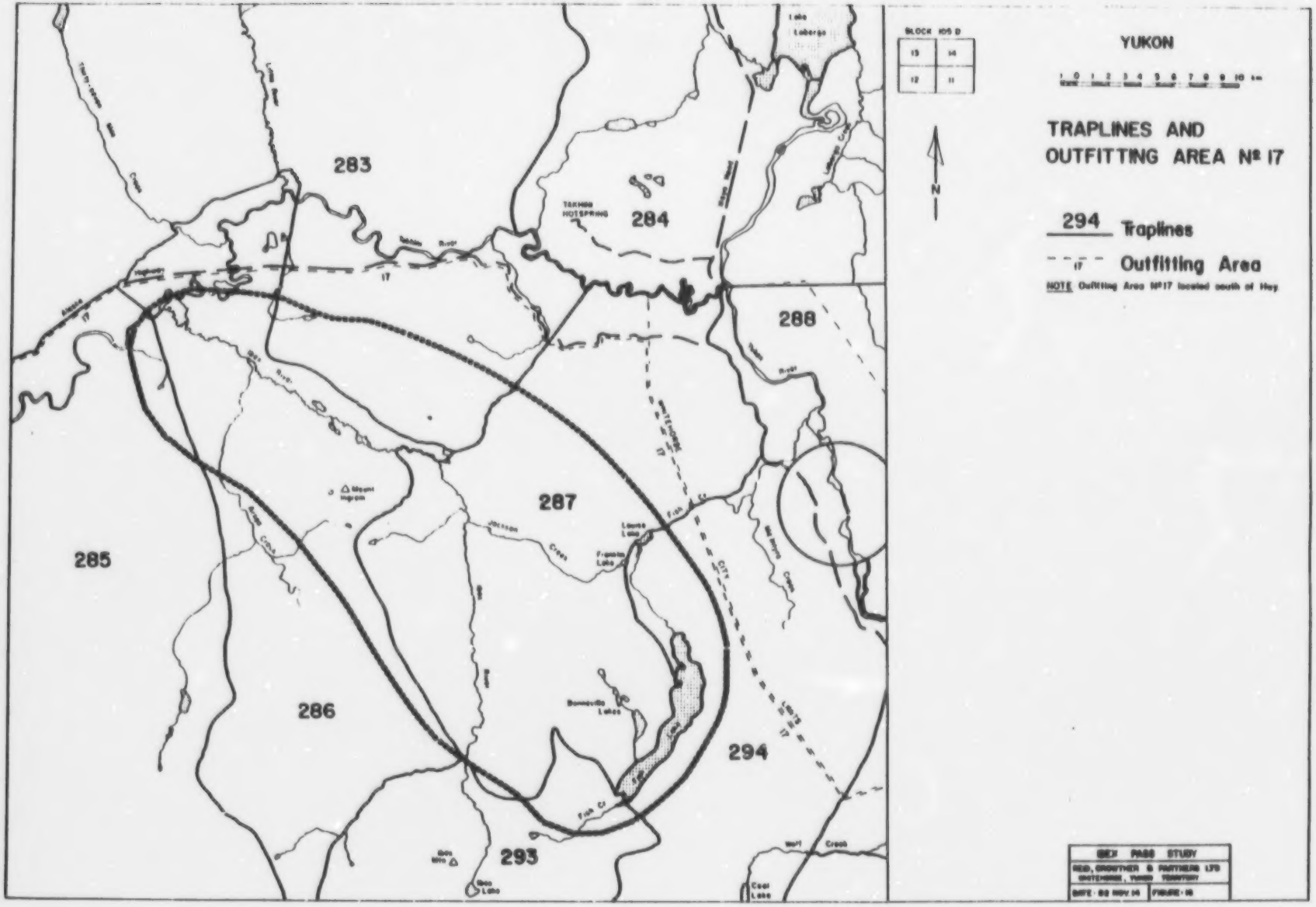
Information provided by the Wildlife Management Section, Yukon Department of Renewable Resources

TABLE 9

TOTAL DOLLAR VALUE
FROM FUR HARVESTS IN TRAPPING AREAS
286, 287 and 294

	1978-79 Estimated Average			1979-80 Estimated Average			1980-81 Estimated Average		
	# Trapped	Dollar Value	Total Value	# Trapped	Dollar Value	Total Value	# Trapped	Dollar Value	Total Value
Bear	0	0	0	0	0	0	0	0	0
Beaver	25	34.08	850.00	40	36.40	1,456.00	7	32.42	226.94
Coyote	8	71.36	570.88	6	54.00	324.00	6	61.15	369.90
Red Fox	3	107.51	322.53	6	73.62	441.72	5	104.86	524.30
Lynx	66	343.94	22,700.04	81	210.12	17,019.72	140	286.65	40,131.00
Marten	1	35.70	35.70	-	-	-	-	-	-
Mink	-	-	-	6	26.44	158.64	12	34.29	411.48
Muskrat	23	5.70	131.10	119	6.23	741.37	-	-	-
Otter	-	-	-	11	58.73	646.03	-	-	-
Squirrel	82	2.10	172.20	342	1.70	581.40	115	1.40	161.00
Weasel	-	-	-	6	1.07	6.42	-	-	-
Wolf	1	121.64	121.64	-	-	-	1	89.00	89.00
Wolverine	1	171.73	171.73	1	140.63	140.63	2	190.01	380.02
TOTAL VALUE			$25,075.82			$21,515.93			$42,293.64

Information provided by Resource Management Division, Yukon Department of Renewable Resources, YTG


283
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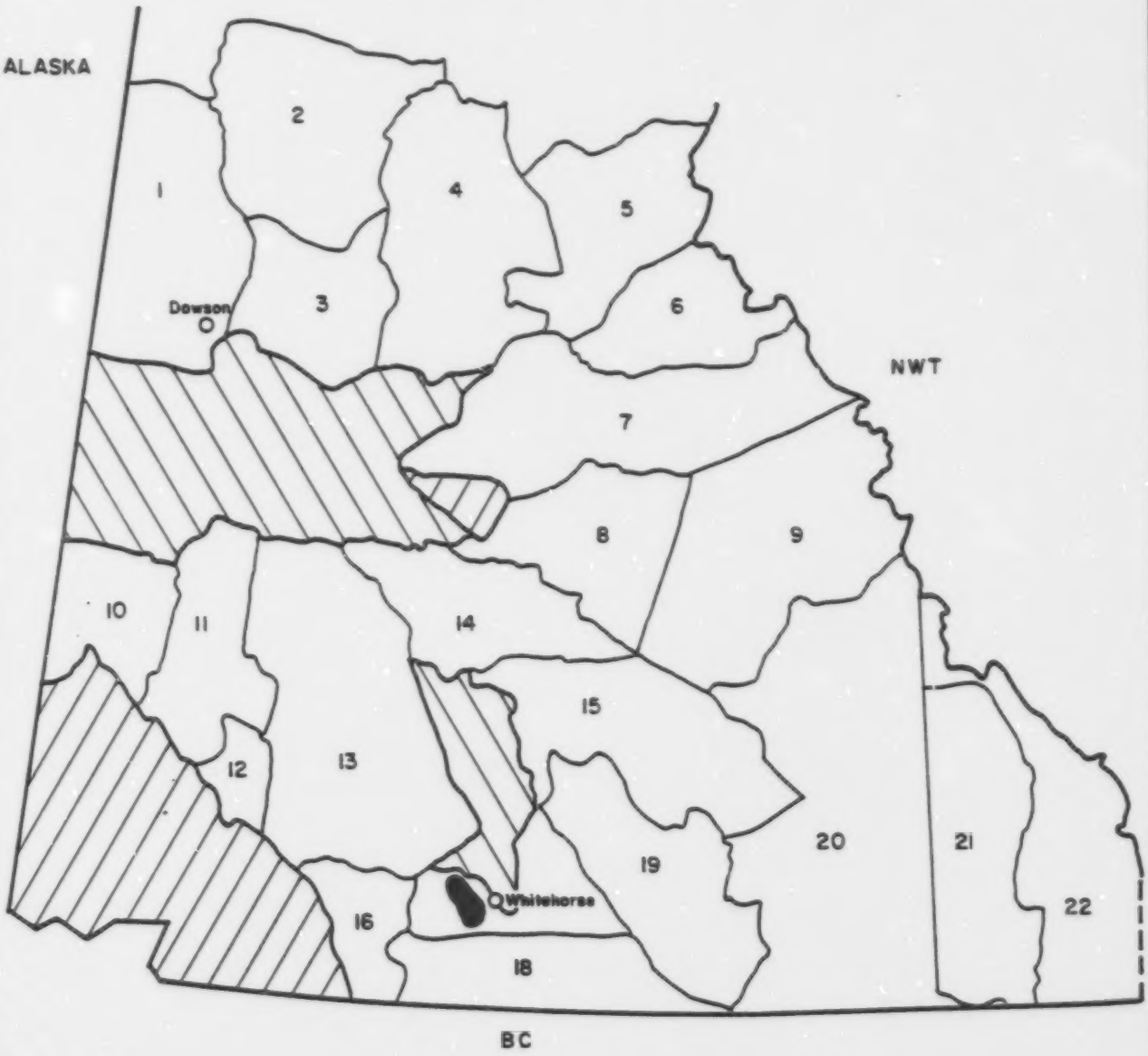
TRAPLINES AND
OUTFITTING AREA Nº 17
294 Traplines
17 Outfitting Area
NOTE Outfitting Area Nº17 located south of Hwy
SEX PASS STUDY
REID, CROUTHER & PARTNERS LTD
WHITEHORSE, YUKON TERRITORY
DATE: 82 NOV 24
FIGURE: 16



BIG GAME GUIDING AREAS IN YUKON

No Guiding Areas

Parks and Game Sanctuaries

Study Area

Source: Wildlife Management Section, Dept. of Renewable Resources

IBEX PASS STUDY	
REID, CROWTHER & PARTNERS LTD. WHITEHORSE, YUKON TERRITORY	
DATE: 82 OCT. 21	FIGURE: 17

hunter days, represents an area much larger than the Ibex planning region. Table 10 on outfitting should therefore only be regarded as an indicator of the overall wildlife resources contained in the guiding area.

Outfitters traditionally try to avoid areas with easy access since it reduces both the hunters' chance of success and his overall "wilderness experience". The majority of animals harvested in Table 10 are probably taken in the more remote areas of the outfitting area and the study area. Dall sheep, for example, which is the most sought after game in outfitting area 17 is rigidly controlled within the northern half of the Ibex study area (refer to Figure 18).

The total number of non-resident hunters allowed into Klaus Heynen's outfitting areas average twenty-one. This number has fluctuated from as high as thirty (1979) to as low as 9 (1981). How many of these hunters would have entered the study area is unknown. The total number of hunter days has also fluctuated based on the yearly number of hunters. This has ranged from 449 (1979) to 196 (1975)(1) and has averaged approximately 324 hunter days between 1971 - 1980 (refer to Table 10). These levels will probably remain constant provided there is not a marked increase in access into either the study region or the overall guiding area.

Fishing

Commercial. There is no commercial lake fishing permitted in the study area, due to the lack of large water bodies which could annually yield a large volume of fish. In addition commercial fishing is closed on the Takhini River during the summer salmon migration.

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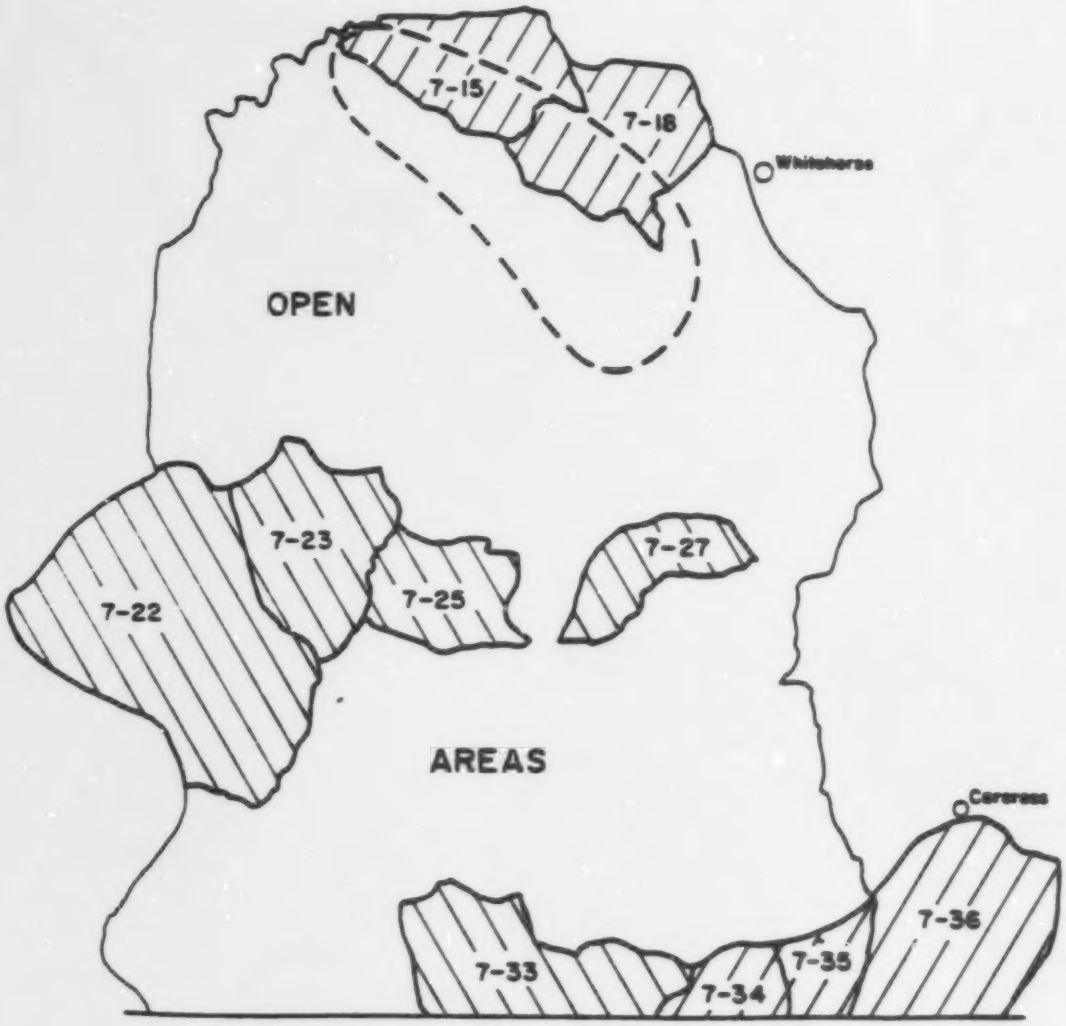
(1) 1981 hunter day information unavailable

TABLE 10

HARVEST STATISTICS FOR OUTFITTING AREA 17
1971-1981

Harvest Statistics	1971	1982	1973	1974	1975	1976	1977	1978	1979	1980	1981	Total	Average
Total Number of Non-Resident Hunters	14	29	29	23	13	14	15	27	30	28	9	231	21.0
Total Number of Non-Resident Hunter Days	206	438	405	365	196	206	197	380	449	401	---	3243	324.3
Wildlife Harvested													
Dall Sheep	10	19	21	16	10	10	5	19	17	17	7	151	13.72
Moose	8	23	18	20	10	8	5	20	24	20	7	163	14.8
Grizzly Bear	4	4	3	4	3	3	1	3	1	3	0	29	2.6
Caribou	0	10	10	5	5	0	5	4	2	3	0	44	4.0
Black Bear	0	0	2	0	0	1	0	0	3	1	1	8	0.7
Mountain Goat	0	0	0	0	0	0	0	0	0	0	0	0	0.0
Wolverine	0	0	0	1	0	1	0	1	0	0	0	3	0.3
Wolf	0	0	5	6	1	1	3	1	1	2	0	20	1.8

Information provided by the Wildlife Management Section, Yukon Department of Renewable Resources



G.M.Z.7 SHEEP PERMIT AREAS

— — — — STUDY AREA

PERMIT AREAS, 1982

AREAS CLOSED TO SHEEP HUNTING, 1982

SOURCE: Wildlife Management Section, Dept. of Renewable Resources

IBEX PASS STUDY	
REID, CROWTHER & PARTNERS LTD. WHITEHORSE, YUKON TERRITORY	
DATE: 82 OCT. 21	FIGURE: 18

Native. There is no information available on the importance (if any) of the fisheries resources of the Ibex Pass study area to the local native community; however, given the low numbers of commercially important fish species, it can only be assumed that the subsistance use of fish resources has been minimal.

Sport. Many of the lakes in the Ibex Pass study area are popular fishing locations for both residents and non-residents. The most important of these are Fish Lake, Louise Lake (Jackson Lakes) and Scout Lake. While Fish Lake supports moderate grayling and lake trout fishing, Scout Lake and Louise Lake are mainly known for their rainbow trout fishing. This is the result of a major rainbow trout stocking program initiated by the Department of Fisheries and Oceans. In addition Scout Lake has recently been stocked with coho salmon.

It has been estimated that Arctic grayling presently make up 50% of the total number of fish caught by Yukon sport fishermen while lake trout represent approximately 30% (Paish & Associates 1981). In the Ibex Pass study area these percentages may be more evenly distributed, with a significant proportion of the sports catch being rainbow trout. Unfortunately, catch estimates are not available for any of these sites.

CAPABILITY FOR POTENTIAL LAND USE

Generally the capability of the study area to support various land uses can be determined through the limitations of the physical resources of the area. The following sections describing potential land use capability attempt to accomplish this task. Overlying the framework of physical features are other factors which may substantially shape the future of the Ibex region. These include the proximity of the City of Whitehorse and attendant pressures and the possibility of the Ibex route being selected for the Alaska Highway Natural Gas Pipeline.

Physical Features Capability

From a geotechnical engineering point of view development could take place within the Ibex valley and the major tributary valleys. Slopes adjacent to the valleys are less well suited for development because of the variable sloping topography and the presence of bedrock in many areas.

Foundation conditions for buildings or earth structures consist of sand and gravel or sandy till, both of which are expected to be well drained and free of permafrost. Glaciolacustrine silt and sand in the Takhini River valley at the mouth of the Ibex Valley are expected to be less well suited for development because they are more fine grained, more poorly drained and likely contain ice-rich permafrost in some areas.

Soil conditions in the major valleys are generally free draining. Groundwater for domestic supply is expected to be available in many areas. Development of groundwater resources and planning of septic beds in developments areas will however have to be carefully planned and controlled in order to avoid contamination of aquifers (refer to Figure 4).

Areas suitable for agricultural development are restricted to the Takhini River valley, where soils are fine grained enough to support crops and grazing.

Granular material for road construction and bedding material could easily support construction activity in the Ibex Valley.

Ibex River and its major tributaries offer several attractive sites for hydro power development. The size of these projects would, however, be limited by available storage capacity.

No major hazards are expected to effect development in the

Ibex valley. Seismic risk should be accounted for in the design of any structures. Some flood potential may exist along Arkell creek and Takhini and Ibex Rivers. Steeper slopes may be prone to isolated rock falls, and slopes in glaciolacustrine soils near Takhini River show evidence of sloughing.

Another important regional consideration is the overall scenic value of the Ibex study area. The view through the Ibex Pass is rated by some as exceptional. In addition, the jagged cliffs of Mount Granger and North Mount Ibex provide excellent wildlife viewing. In general the study area has many unique geologic and physical features which enhance both scenic and wildlife viewing.

Residential Capability

The present level of residential use in the Ibex area is very low (one permanent resident only), but could alter over time. In the Whitehorse area there is a certain pressure to allow rural residential development and as several lots already exist in the Louise, Franklin and Fish lakes area, the potential for residential use exists. However, the Area Development Ordinance designates particular areas for rural residential development. Although the Tourism Planning and Development Branch foresees a potential for cottages (Spicer and Burton 1982 - pers. comm.), information displayed on the ELS maps would indicate the lakes area is not the most suitable for conversion to permanent residential use. Factors examined to reach this conclusion are terrain suitabilities for septic systems, permanent buildings, camping and outdoor living, and highways and roads. In many cases, drainage was the limiting factor; permafrost and material also have been noted.

In the event that improved access occurs, especially down the Ibex River and Sout Lake valleys, areas along the valley which have higher capabilities for supporting residential use would become available. However, there exists an oversupply of servicing housing lots in the City of Whitehorse and the potential for this land use within the study area is considered low.

Access and Transportation Capabilities

The potential development of increased access and transportation routes into the study area depends on other developments which may or may not occur and thereby create a demand for access. These events include fuelwood/ sawlog extraction, mineral resource extraction, recreational developments, hydroelectric use and the Alaska Highway Gas Pipeline. Access created to meet any of these demands is expected to take place on routes already roughly established (i.e., road status) in the study area. The ELS mapping series (1982) identifies the Ibex Valley and small spurs up the Scout Lake valley and Jackson Creek as possessing good suitability for roads and highways; other areas have less suitability. The potential for fuelwood/sawlog access is greatest in two areas: the first would be upgraded access through the Scout Lake valley to complete harvesting of wood which commenced several years ago, and the second would be access from the Alaska Highway at the north end of the Ibex River valley to an area where a sawmill permit has been applied for.

Although the current level of mineral activity in the study area does not create the demand for new access roads, the changeable nature of the minerals market and the potential for new mineral discoveries can alter this condition. A road was recently constructed to access coal deposits just to the south of the study area; this resource could extend into the study area and call for additional road development. At the present time, Whitehorse Copper has several exploration roads in the Mount McInytre area directly west of Fish Lake. The future of these routes is uncertain if the company remains closed beyond the next two year period.

Increasing frequency of recreational activities in the study area may create pressure for road access. This would be especially true in the Fish and Louise Lakes area (although the existing road would merely be improved in all probability); down the Scout Lake valley to reach fishing spots and the Recreational Reserve; and finally at the

north end of the Ibex Valley and down its length to take advantage of wildlife viewing potential.

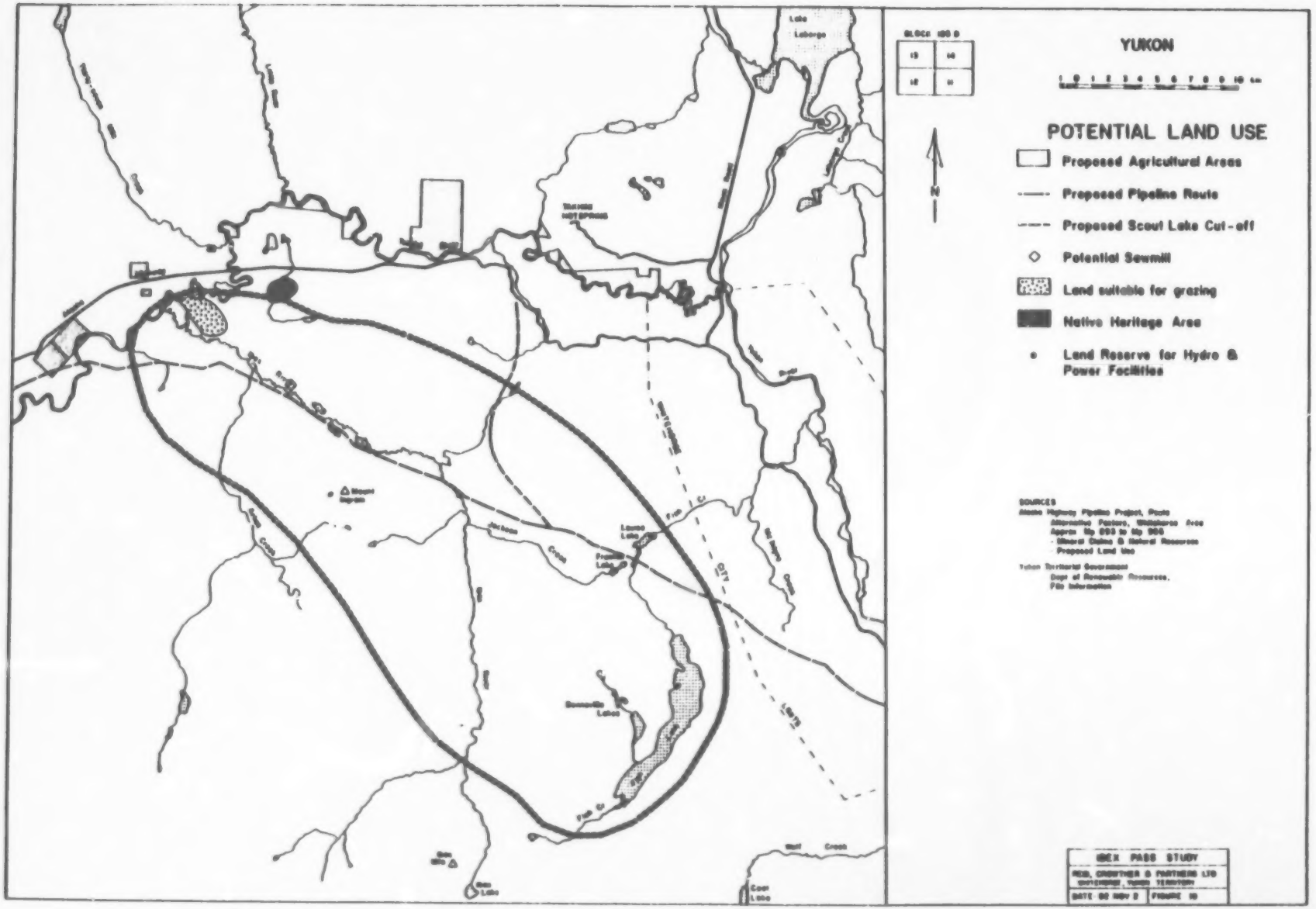
The expansion of hydroelectric power in the study area is unlikely to create new roads as development would take place in locations already accessible. The number of trips or type of vehicles using the road may change, particularly during any construction phase.

The routing of the Alaska Highway Gas Pipeline through the Ibex Valley could create pressures to develop access - for both pipeline construction and maintenance phases. At the present time the final route has not been decided on although Foothills Pipe Lines prefers the route which crosses the study area north of Fish Lake and continues in a northwesterly direction along the south side of the Ibex River (refer to Figure 19).

Alterations to transportation routes peripheral to the study area can effect pressure on roads within the area. According to Highways and Public Works (Hindinger 1982 - pers. comm.), the Alaska Highway upgrading project could commence in the near future. If this resulted in increased travel on the route, it is possible that more traffic would leave the road and enter the Ibex area.

Water Resources Capability

The City of Whitehorse has conducted studies to determine the feasibility of supplying the increased demand for water from Fish Lake through expansion and alteration of the existing Yukon Electrical Company Limited's facilities. Two methods of accomplishing this task might be considered. The first involves transmission of water from Fish Lake to a proposed reservoir in the Hillcrest Development Area involving new construction, and the second focuses on expansion of the existing system. In this latter scheme another power station is proposed; however, it is situated outside the study area. Since this scheme is substantially less costly, it would likely be the one implemented.


YUKON
POTENTIAL LAND USE
Proposed Agricultural Areas
Proposed Pipeline Route
Proposed Scout Lake Cut-off
Potential Sawmill
Land suitable for grazing
Native Heritage Area
Land Reserve for Hydro & Power Facilities
SOURCES
IBEX PASS STUDY

In terms of the resources of the Ibex area, the project would require that the level of the dyke controlling flow from Fish Lake be raised, thereby raising the level of Fish Lake and likely altering flow regimes down through the Louise Lake system. This action would have implications for physical resources (fish, water quality) and land use (recreation, cottage lots).

Other potential activities in the area which could have an effect on water resources include increased recreation (horses, vehicles and humans travelling in the area can increase sediment loads in streams and reduce water quality), resource extractive activities which may have water requirements for drilling, and pipeline or road construction which would need water for dust control and gravel washing.

Mining Capability

On the basis of past and present activity related to minerals as indicated through claims and leases, the possibility of mining within the Ibex area cannot be eliminated. The proximity to Whitehorse of the Ibex area makes the location favourable to development activities. Within the context of the entire Yukon the existence elsewhere of more viable mineral deposits reduces the potential for development within the study area. This situation could be altered by important mineral discoveries or greatly improved economic conditions.

Agricultural Capability

The moratorium of 1975 has effectively frozen agricultual land use into the pattern which existed at that time and it is difficult to determine if further agricultural uses would have occurred if the moratorium was absent. According to Redpath (1979) the reasons for the moratorium are:

- to stop the spread of agriculture to non-productive lands;
- to enable the federal and territorial governments to jointly develop long-term disposal policies;

- o to identify agricultural areas offering the most chances of success in accordance with federal and territorial land use plans; and
- o to enable necessary soil and climatological surveys to be completed in order to identify potential agricultural areas.

At the present time, only one specific location for agricultural development within the Ibex Pass study area has been pinpointed, this being a 6 ha parcel of land situated beside Franklin Lake (Figure 19). In a general manner the information mapped on the ELS series indicates that capability is rather limited. The highest capability identified is Class 5 described as lands having very severe limitations that restrict the capability to produce perennial forage crops although improvement practices are feasible. Isolated pockets of land of higher capability may exist but these are not mapped. Sites of Class 5 are located primarily in the valleys of the study area, that is, along the Ibex River, Jackson Creek (especially adjacent to Louise and Franklin Lakes), Arkell Creek and the Scout Lakes valley. More contiguous Class 5 lands are located to the north and west of Arkell Creek as the Ibex River valley opens up towards the Takhini Valley. Limitations to agricultural capability are imposed by adverse climate, erosion and steep slopes, and occasionally consolidated bedrock.

The Yukon Territorial government is currently accepting applications for agricultural land use (as of May 1982) but it is not known if requests have been made for land in the study area. If interest in developing agricultural land is expressed, it will likely be concentrated in river valley locations for forage or grazing purposes only. Until the moratorium is formally lifted, however, no development will be occurring.

Forest Capability

The Forest Resources Division of DIAND is planning to conduct a forest inventory in the Ibex region, but at the present time no inventory information is available. Without this basic resource data,

it is inconclusive as to whether or not certain uses of the forest will occur. According to the Forestry Office (Dumas 1982 - pers. comm.) timber in the area is primarily not merchantable at the present time due to lack of access. An operator has applied for a sawmill permit near the north end of the Ibex River, but a permit on this land use has been delayed pending decisions on the finalized Alaska Highway Gas Pipe Line route and the Ibex management plan.

The other pctential use of the forest resources is to supply greater volumes of fuelwood. Some areas generally identified as being capable of supplying fuelwood are indicated on Figure 5. Although these areas are not exactly delineated, it is reasonable to assume that those most accessible will be utilized first.

In the case of access being constructed to build and service the Alaska Highway Gas Pipeline, both fuelwood sites and cutting areas would become more easily accessible. This could result in the utilization of a resource which would otherwise be inaccessible.

Of interest is the Yukon Lands and Forest Service Nursery north of the Takhini River (Figure 5). Seedlings are raised for reforestation programs and other experiments are undertaken on a variety of test plots. This program offers considerable potential for experimentation with tree species suited for wind breaks, landscaping, seed production and wood harvesting (WNMPP 1979).

Recreation Capability

The present level of recreational activity in the Ibex study area is relatively low. The Land Use Information Series (1973) noted that the area of Fish, Louise and Franklin lakes has moderate capability for outdoor recreation. It is possible that increased participation in all forms of currently occurring recreational activity could take place. Other potential recreation developments in the study area include viewing scenic features such as the kame deltas and terraces prevalent

in the Mount Arkell region (LUIS 1973). In other areas along the Ibex Valley and Scout Lake Valley, forest fire damage limits the potential viewing sites although as regeneration continues, the viewing potential will alter. The Tourism Planning and Development Branch commented on the viewing potential of the valley side areas during trail rides (Burton and Spicer 1982 - pers. comm.).

As cottage development has already occurred to a limited extent near Louise and Fish lakes, the potential exists for expansion of this land use. A series of terrain suitability maps (ELS 1982) were examined to describe the potential for certain developments. In terms of suitability for permanent buildings, camping and outdoor living, septic systems and highways and roads, the Louise and Fish Lake areas do not appear most favourable based on any of these parameters. Generally, the Ibex River valley and, to a certain extent, the Scout Lake valley, appear to the most favourable sites within the study area for these locations are developing recreation land uses, however, where other land uses also tend to have high potential.

Other specific recreational areas for expansion that have been identified, include the Scout Lake area (due to present access, recreational reserve) and the access route from the Whitehorse ski chalet (equestrian, hiking and cross-country ski trails; general recreational access; cottage and lake access). Outdoor pursuits conducted at an increased level may enhance the chances for man/animal conflicts and it has been suggested that it may be preferable to encourage day use (Spicer and Burton 1982 - pers. comm.).

The single most important factor in altering the level of recreational use within the study area would be the improvement of access. Whether this occurred for reasons associated with improved cottage access, extraction of forest or mineral resources, pipeline construction or purely for the recreation market itself, this factor could increase opportunities for entering the study area for recreational purposes. An exception to this enhanced activity level might be outfitting

which relies on a degree of isolation and inaccessibility from the general public.

Wildlife Capability

The overall capability of wildlife in the Ibex Pass study area is exceptionally high in comparison to its surrounding region. Individuals within private industry, government and business all recognize the recreational potential of this area, primarily because of its close proximity to Whitehorse. Equally, the majority of individuals interviewed (refer to Appendix C) realized the importance of proper land management in protecting sensitive areas.

Overall the various wildlife-oriented land uses around can be summarized within the following categories:

- o wildlife viewing (i.e., photography, hiking, bird watching, etc.)
- o hunting
- o trapping
- o outfitting
- o scientific research

In order to successfully achieve the goals and objectives of all interested parties, each one of these categories must be weighed with equal importance. The overall importance of each of these wildlife capabilities is discussed in the following sections.

Wildlife Viewing. All Yukon residents and visitors enjoy being able to view wildlife, especially in Canada's last great frontier. Yukoner's are fortunate to have a wildlife viewing area like the Ibex at their "own backdoor". The Ibex study region supports large populations of Dall sheep as well as other large ungulates. While sheep are the most observable big game species, other wildlife forms such as grizzly bear, black bear and moose are often seen. Many of these wildlife species (i.e., the Dall sheep) can be viewed from existing roads, especially through areas such as the Ibex Pass.

Hunting. Hunting is important to many Yukoners as a means of overcoming the high cost of store bought meat. In addition sport hunting is an important source of recreation for both residents and non-residents. The net result of this form of hunting is to exert pressure on certain wildlife populations. To offset these pressures, management practices have been introduced in an attempt to avoid overharvesting. Accessible regions within the Ibex planning area have provided a large number of hunter days for local Yukon residents. Understandably a value cannot be placed on the enjoyment level of these hunter experiences other than to assume it is quite high. The overall harvest data indicates that between 1978-80 game management subzones 7-18 and 7-19 have been the most productive for Yukon hunters (refer to Table 7 and Figure 6). It is also important to note that these have been the areas most easily accessible by road.

In summary the capability of maintaining the current levels of wildlife in the Ibex is dependent on proper management practices. The overall number of protected species such as elk, caribou and mule deer, appear to be maintaining themselves, however, this has not been verified by survey. Other big game species are not limited in their distribution and are relatively abundant. These populations should continue to attract many resident and non-resident hunters to the study area.

Trapping. Trapping is considered a legitimate land use activity and in some areas of the Yukon is the most economically and ecologically sound exploitative resource activity (Western Fur Managers Conference 1980). The Yukon Department of Renewable Resources has stated that it will not promote the heavy use of the fur resource until the department has a good assessment of land capability for fur production and has developed management strategies for species of concern (Western Fur Managers' Conference 1980). In the Ibex Pass study area land capability estimates for fur production have been based on trapline yields as opposed to surveys conducted by the Wildlife Management Section of the Yukon Department of Renewable Resources. Consequently, it is difficult to assess the actual capability of the area.

In summary the overall capability of trapping in the Ibex Pass study area appears (based on harvest estimates, Table 8) to be relatively high. To further substantiate this claim, however, proper surveying of the resource base will be required.

Outfitting. Outfitting is an important land-based business regulated by game management policy, economic conditions and resident access. Any fluctuation in these regulatory components can dramatically alter the outfitting capability of a specific area.

The overall success rate of Klaus Heynen in sustaining substantial harvests over the past eleven years (1971-81) indicates the capability of this resource in both the Ibex Pass study area and its surrounding territory. If it is a priority to maintain the non-resident hunter success rate within the study area, new road access should be restricted especially in the regions which are presently isolated.

Scientific Research. In a time of financial restraint the value of research areas in close proximity to Whitehorse cannot be underestimated. The Ibex Pass study area, with its diversity of habitat types and overall wildlife capability, provide a good opportunity for local wildlife management officials to study a host of topics at a reduced cost. These may range from enhancement programs to specialized wildlife studies. The value of utilizing this land resource in adopting and implementing wildlife management policy for similar areas in the Yukon may prove to be a very plausible future consideration.

Fishing Capability

The Ibex area is currently unavailable for commercial fly-in fishing operations until such time as the Department of Fisheries and Oceans establishes a policy for licensing them.

The major capability of fisheries in the study area centres around the stocking programs in Louise Lake (Jackson Lakes) and Scout

Lake. In the future stocking will only continue in landlocked lakes of which Scout Lake is presently the sole recipient. Fishing in other areas such as Fish Lake is reasonably high, attracting both resident and non-resident fishermen.

Native fishing in the Ibex area is presumed to be minimal although this has not been verified through surveys. The potential for commercial fishing is also low.

Pipeline Corridor

The Alaska Highway Gas Pipeline Project as proposed by Foothills Pipe Lines (South Yukon) Limited has the capability to affect potential land uses within the Ibex Pass study area. Foothills proposed to construct and operate a buried natural gas transmission line to initially transport Alaskan gas to United States markets in the lower 48 states. The proposed Yukon section runs from Beaver Creek in Western Yukon, along the Alaska Highway for approximately 818 km to Watson Lake (Redpath 1979). The pipeline will be 1422 mm (56") outside diameter after connecting with the Dempster Lateral and 1219 mm (48") prior to that. Therefore, depending on the tie-in location of the main Alaska Highway Pipeline with the Dempster Lateral, diameter through the study area could vary. Foothills' preferred route, however, indicates that 1422 mm pipe will be used through the Ibex Valley. No compressor stations are projected within the study boundaries. Construction of the pipeline will require:

- the provision or upgrading of access;
- clearing land along the corridor length for a width of up to a maximum of approximately 240 m depending on terrain conditions and soils (40 m to be cleared in final right-of-way);
- trenching to place the pipe in location; and
- returning the removed surficial materials to bury the new pipe.

The time required for construction through the study area is scheduled such that construction commences in July and finishes the following December for a total period of 18 months (Foothills Pipe Lines (South Yukon) Ltd. 1981). This period and the time following are when land use changes will be appreciated although the finalization of a route will begin the process.

The preferred Foothills route follows the Ibex River, crosses between Louise and Franklin Lakes and continues on towards Whitehorse. Alternative routes do exist for the pipeline. That which has a bearing on the study area is the Scout Lake Cut-off, which departs from the preferred route at a point north of Jackson Creek to proceed north and meet the Alaska Highway route, thereby eliminating a portion of the preferred route located adjacent to the Ibex River. The Environmental Assessment Panel has reviewed the various pipeline routings and concluded that because of the potential for high environmental impacts and the loss of future options on the connection with the proposed Dempster Lateral Pipeline, the Ibex Valley Route Alternative should be rejected. Until a final decision is reached on pipeline routing, future land uses affected by the pipeline can only be described in a general manner.

First, the corridor reserve will be narrowed to construction limits of 240 m centred on the chosen route. After construction a narrow 40 m right-of-way would remain with Foothills for the purpose of natural gas transmission (Yarrington 1982 - pers. comm.; Foothills Pipe Lines (South Yukon) Limited 1981). Minimal residual access will be required only for maintenance purposes in the event of pipeline rupture or some other such occurrence would much travel be generated along the right-of-way. Foothills has stated that the company will undertake to limit or destroy any new access after construction is complete, if directed to do so by land owners, i.e., the Crown (Foothills Pipe Lines (South Yukon) Limited 1981).

THE DATA BASE

Adequacy and Requirements

During the course of this study, a number of inadequacies have been identified in the data base. Sometimes this situation exists because of limited studies on certain resources. Occasionally too, the situations have been one of inaccessibility of information. The various adequacies and requirements of the data base are identified in Table 11 as well as some of the concerns which have arisen because of these information deficiencies.

PROBLEMS AND ISSUES IN LAND USE

The Ibex Pass study area is presently characterized as having a limited number of unique regional attributes (i.e., wildlife resources). The approach to dealing with the development or protection of these attributes depends primarily on the appreciation of the existing and problems or issues which surround their presentation. Therefore, the approach to this section is to identify, at a regional level, the most important resources within the Ibex Pass study area and to then outline the existing and potential problems or issues which might jeopardize those resources.

The Importance of the Ibex Study Area in a Regional Context

There are a number of specific resource characteristics which highlight the Ibex Pass study area in a regional context. These resources are identified at this juncture, in order to prepare for the development of management alternatives in the Chapter III. Other resources, while perhaps considered important locally within the study area, do not stand out at a regional level and as a consequence, are not discussed.

TABLE 11

THE DATA BASE - ADEQUACY AND REQUIREMENTS

	REGIONAL INFORMATION	IBEX STUDY AREA	LIMITATIONS AND REQUIREMENTS
Biophysical Conditions			
Physical Features	adequate	adequate	
Soils/Permafrost	adequate	adequate	
Climate	adequate	adequate	Climatic information collected through Whitehorse weather office - not in study area
Vegetation	adequate	adequate/limited	No information on rare species - No information on burns prior to 1958
Wildlife			
Raptors		adequate	
Moose	adequate/limited	adequate/limited	Moose surveys are limited to fall and winter - no summer surveys completed
Caribou	limited/restricted	limited	Population densities unknown
Elk	limited/restricted	limited	Population densities unknown
Mule Deer	limited/restricted	limited	Population densities unknown
Dall's Sheep	adequate/limited	limited	Information limited on critical range, mineral licks and lambing areas outside of Ibex Pass region
Grizzly Bear	limited/restricted	adequate/limited	No information available outside of Ibex Pass regarding movements, range requirements, population densities
Furbearers	limited/restricted	limited/restricted	Muskrat survey. Beaver survey to be conducted this fall. No other fur-bearer information other than harvest data.
Fisheries	adequate/limited	limited	Aquatic inventory conducted by Inventories Section, YTG - only information available on species composition in Ibex area
Land Use			
History/Land Disposition	adequate/limited	adequate/limited	Some uncertainties regarding present land status
Heritage Resources	adequate	adequate	Information limited outside pipeline corridor
Residential	adequate		

TABLE 11
(cont'd)

	REGIONAL INFORMATION	IBEX STUDY AREA	LIMITATIONS AND REQUIREMENTS
Access Transportation	adequate	adequate	Whitehorse Copper after mine closes Better mapping of present roads, accessibility and levels of use needed
Agriculture	adequate	adequate	Inventory planned - however, no inventory information regarding acreage/potential fuelwood presently available
Forestry	adequate	limited	
Recreation	adequate	limited	limited information available on levels of recreation use
Power Production	adequate	limited	What are Yukon Electrical's plans for area? How does this conflict/interact with fisheries recreation access?
Mining	adequate	adequate/limited	What is the status of coal leases and the potential for future coal development?
Hunting	limited	limited	Harvest data limited on big game species prior to 1978
Trapping	adequate	adequate	
Outfitting	adequate	adequate	
Fishing	limited	limited	no creel census information available
Pipeline	adequate	adequate	need to know pipeline construction methods proposed

Adequate: implies that there is enough quantitative information to adopt sound management options.

Limited: implies that there is enough qualitative information to suggest management options.

Restricted: implies that there is little qualitative information available to allow for the development of any management options.

Wildlife Resources. Regionally the Ibex Pass area supports a number of sites which are important either seasonally or annually to certain wildlife species. In addition these populations have been identified as being unique either because of their local population densities or their overall rareness (both regionally and in the North American context). The species identified are Dall sheep, moose, golden eagle and gyrfalcon. The following is a brief description of the regional importance of each animal.

a) Dall Sheep

In the vicinity of Mount North Ibex estimates run as high as 50 to 70 animals utilizing the slopes year round, while another 30 to 40 animals are found on Mount Ingram. On a regional basis these population numbers are significantly higher than any other area surveyed.

b) Moose

Large concentrations of overwintering moose have been identified in the Ibex Pass River valley. During the late winter this area is recognized as critical range for the resident moose population. Regionally, any area which support these large concentrations of overwintering moose is considered sensitive.

c) Golden Eagle and Gyrfalcon

Regionally the study area contains some of the best golden eagle and gyrfalcon habitat found anywhere in North America. The most intensively utilized habitat of these cliff-nesting raptors in the study area is along the ridges of Mount Ingram and the south-facing slopes of Mount North Ibex.

Hunting Capability. Certain sections of the study area provide local hunters with some of the best big game hunting in the Yukon Territory. This is primarily a function of the present ease of access into both the northern and southern regions of the study area.

Recreational Resources. While a number of different recreational activities occur in the study area, there are not many which presently stand out at a regional level. The exceptions are hunting (which has already been discussed under hunting capability) and sport fishing. Regionally Scout Lake has been identified as an excellent spot for rainbow trout fishing; this is the result of heavy fish stocking programs initiated by the Department of Fisheries and Oceans.

Heritage Resources. Although it is difficult to determine the relative significance of the Ibex area in a regional context since most areas have not been examined for heritage resource potential, it is clear that a large number of sites (>101) are found in this area. Heavy utilization of the Ibex Pass is suggested by the number of sites identified. Approximate indicators of value have been placed on these sites. They range in value from low to high. So until more detailed site information is available, this area will be considered to have potential and to be quite significant in the regional context.

Hydro Potential. Currently hydro electric production within the study area (Fish and Jackson lakes) plays a very minor role in the supply of power for the Whitehorse region. Yukon Electric Company Limited is interested in additional development of facilities within the study area in the form of small headponds downstream of Fish Lake. The expected additional generation of power would be approximately 2 MW. However, additional electricity could be produced from other sites in the area. For example, Yukon Electric is currently in the process of applying for a license for additional facilities to produce 750 kW on McIntyre Creek which is located just outside the Ibex study area boundaries.

Existing Problems in the Ibex Pass Study Area

The existing problems or issues surrounding present land use activities in the Ibex Pass study area are related primarily to hunting and access. While hunting capability is extremely high throughout the region, conflicts arise concerning Dall sheep and their current hunting status in two specific game management subzones. Dall sheep are known to migrate between Mount North Ibex and Mount Ingram. Mount North Ibex (located in Game Management Subzone 7-15) is currently protected from sheep harvesting while Mount Ingram is open to hunting on a seasonal basis. The outcome of this problem is the potential elimination of mature rams from the Mount North Ibex flock, in the event that they happen to migrate onto the slopes of Mount Ingram during hunting season.

Potential Problems In the Ibex Study Area

Access presently represents a management problem in the Ibex Pass area in that vehicles may travel into and through the area thereby potentially disrupting both migrating and static wildlife populations. Similarly, access along the southern end of the Ibex River is thought to increase the annual rate of animal harvest.

Increased ease of access into the study area could take place as a result of additional mineral exploration and other forms of land use development. Were this to occur there would be the prospect of additional resource management problems, including hunting of wildlife populations. Thus one of the principal concerns respecting the selection of preferred resource management options in the area would relate to the implications of such options for access by other than recognized resource users.

III. GOALS AND ALTERNATIVES FOR THE STUDY AREA

INTRODUCTION

The resources described in Chapter II are subject to various forms of management and use as expressed through many institutional managers and land users. During the course of the study every effort was made to ascertain the goals and objectives of these managers and users in order to gain a better perspective on what range of resource management alternatives could be introduced in the future. In some instances precise goals and objectives are quite apparent. In other instances they may not have been articulated by public and private agencies, but through practice and custom an informal set of "management arrangements" has been derived. For northern Canada generally and in the particular case of Ibex Pass the task of delineating precise goals and objectives is rendered difficult for several reasons. These include, but are not necessarily restricted to the following:

- the apportionment of jurisdictional powers and land management responsibilities among a range of federal, territorial and occasionally private organizations;
- the absence of sufficient background data from which to derive goals and objectives;
- the lack of general, clearly defined planning programs or strategies which could act as an umbrella for the specific goals and objectives of various agencies;
- the uncertainties with respect to native land claim settlements; and
- the general freezing of land within the 8 km wide pipeline corridor which affects a considerable portion of the study area.

We recognize that these and other conditions have contributed to the need for the present report. The task now is to identify a series of potential resource management strategies which are derived from analysis of the information presented in Chapter IV.

In the first step to this end Chapter III presents a series of possible approaches to the management of individual resources in the study area. For each resource a goal (or goals) for management of that resource is articulated, that goal (or goals) being derived from baseline information presented in Chapter II and generally recognized principles for the continued conservation and utilization of that resource. Following the presentation of the goal (or goals) for each resource a series of alternatives or strategies that could be implemented to achieve the desired goal (or goals) is set out.

The number of alternatives presented varies according to the number of viable alternatives perceived to exist. The order of alternatives is not necessarily related to other similarly numbered alternatives. It should be noted that the various alternatives represent a range of intensity of use of development.

These alternatives are followed by a presentation on possible land use decisions which could flow from the alternatives. The examples presented are intended to be indicative rather than specific. These are but a few of a range of possible land use actions which could flow from the selection of individual alternatives for resource management. They have been included here to suggest that a comprehensive set of land use strategies could be adopted for the study area provided that the composite end product is an integrated management plan which is cognizant of the area's resource capabilities.

The merit of the exercise set out in Chapter III is that in developing a number of overall management alternatives or strategies and related concept plans for the Ibex Pass area reference may be made to the goals, alternatives and land use consequences set out for individual resources in Chapter III and their applicability to each management strategy appropriately identified.

INDIVIDUAL RESOURCE MANAGEMENT GOALS AND ALTERNATIVES

Archaeological Resources

Goals

(1) To ensure that there is adequate protection of important archaeological resources.

(2) To encourage the development of the education/ interpretive role of archaeological resources.

Alternatives

(1) To identify and to develop mechanisms for the protection of areas of archaeological significance.

(2) To identify and to develop mechanisms for the protection of artifacts of archaeological significance.

(3) To identify and to develop mechanisms for the protection of artifacts of archaeological significance. Preserve archaeological sites only in the case of exceptional significance and/or strong potential for development for an interpretive/educational role.

Each of these alternatives would require an archaeological study before any development could take place. The alternatives deal with various ways of preserving archaeological resources which have been identified as significant.

(a) Alternative 1

Alternative 1 would prohibit development of any type which disturbed, covered or impinged on a significant archaeological site. The implementation of this alternative could create a number of locations at which no development except one of an archaeological nature could occur. While a large number of archaeological sites have been identified incomplete information about the significance of these sites remains a problem. This situation presently renders difficult assessment of the location/amount/or type of land development that could be affected.

(b) Alternative 2

Alternative 2 would permit more flexibility in terms of preserving the archaeological resource. If a potentially conflicting land development affected a significant archaeological site then the artifacts could be carefully catalogued and removed, the ground rehabilitated and the approved development undertaken. This alternative would have the advantage of providing artifacts for interpretive/educational purposes. In addition potentially necessary development would not be inhibited.

(c) Alternative 3

In the Ibex Pass study area there may be a small number of archaeological sites whose exceptional significance and location would lend themselves to being developed as interpretive sites. If such sites now exist in this area they would probably occupy quite limited amounts of land. This type of site would be expected to add to the potential for tourism development.

Potential Land Use Decisions

(1) May require an accredited archaeological study to be completed before any development takes place to determine the possible heritage significance of the development site.

The study would be required only for the specific places of development, (i. e., roads and road allowances, buildings, septic beds, right-of-ways, etc.).

(2) A portion of the Ibex Pass study area has now been examined for this purpose. If the proposed development lay within one of these areas, a study would be required only if the development were adjacent to or impinging on a designated archaeological site.

(3) A review should be made of the completed archaeological study (or studies). Consideration would have to be given to the nature and quality of the artifacts and accompanying data.

(4) If the artifacts are significant they would have to be professionally removed to a designated location prior to approval for development of that specific site.

(5) The interpretive/educational aspect of archaeology could be developed through signage, displays, interpretive sites, or other means.

Residential/Cottage Land Use

Goal

To provide for human occupancy of the study area in keeping with the area's resource capabilities and its land use potential.

Alternatives

(1) To assess the merits of perpetuating existing residences and cottages in the area.

(2) To assess the merits of permitting or restricting additional seasonal/ permanent residences while recognizing the development rights of individuals now possessing titled lots.

(3) To assess the merits of permitting or restricting additional residences and additional cottage lots based upon future demands.

(a) Alternative 1

Alternative 1 would provide for the selective presence of residences associated with prescribed land uses, for example, mining and trapping. Some existing residences might have to be removed. This alternative might be used to enhance the recreational role of the area for the general public and prevent potential land use conflicts with the Yukon Electrical Company. A major drawback to the alternative could be the effects on the present owners of titled lots who had anticipated building a cottage or home. This alternative could result in the elimination of the residence associated with the horseback riding facility.

(b) Alternative 2

Alternative 2 would allow for existing titled lots to remain. These are located in the Jackson Lakes/Fish Lake area. It is anticipated that the titled lots (other than those created for utility purposes) are developable for either residential or cottage use. The implementation of this alternative would allow for a mixture of uses within the recreation oriented areas of Jackson Lakes and Fish Lake because the titled lots are grouped together in specific locations. Other recreation uses (currently taken advantage of by local people) such as group picnics, fishing and boating could be carried on with minimal, if any, conflict. The current Yukon Electrical Company license creates little conflict with developed lots. Future licensing agreements would need to ensure that additional conflicts were not created.

(c) Alternative 3

Alternative 3 would allow the greatest degree of development in this area. (Additional residental lot development has not been included in any alternative since the factors of altitude, winter road maintenance and terrain suitability indicate that this area is not appropriate.) It is recognized that due to the variety and number of alternatives, additional cottage lots are not currently needed. There may be a need for more cottages in this vicinity in the future, but careful siting would be required to avoid conflict between users and to avoid the generally poor terrain suitability for buildings.

Potential Land Use Decisions

(1) There may have to be limitations on the approval of additional cottage/residential lots.

(2) There may be the need to modify the practise of permitting residences to be established in this area through mining claims.

(3) There may be the need to permit the continuing existence and development of additional cottages and residences within existing regulations on currently established titled lots.

(4) There may be the need to permit the development of residences within existing traplines on established trapline territories.

Hydroelectric Power

Goal

To recognize the hydroelectric power resource in this area and to manage it in a manner that is compatible with other types of resource use.

Alternatives

(1) To permit the continuation of hydroelectric production utilizing existing facilities in the study area.

(2) To permit the expansion of hydroelectric production in the future subject to appropriate recognition of the resource capabilities and land uses of affected areas.

(a) Alternative 1

Alternative 1 would have the least impact on other existing or potential uses. Currently the Yukon Electrical Company development appears to be compatibly co-existing with other uses located near these facilities or on the perimeter of lakes associated with hydro facilities. However the creation of the current production facilities included the raising of Fish Lake water levels to the extent that seven

surveyed lots and a Yukon Territorial Government campground reserve was covered.

(b) Alternative 2

Alternative 2 allows for potential future development of the hydroelectric facilities and the related additional generation of electricity. Any expansion of the facililites would have to be evaluated in terms of other existing or potential land uses, notably recreation and their potential consequence for scenic landscape modification. The boundaries of existing titled lot locations now located near the Fish Lake, Louise Lake, Franklin Lake area could be an important factor in determinating maximum water levels.

Potential Land Uses Decisions

(1) Continue to control power generation by means of renewable water power licenses.

(2) Require that an impact study be completed and submitted with any application for expansion of existing facilities or creation of new facilities.

(3) Utilize the results of the study to determine if the additional capability for power generation should be permitted.

(4) To permit the approval of additional electric power generation if the expansion/new facility does not conflict with other resource management objectives.

Mineral Resource Use

Goal

To develop the mineral resources of the area in a manner that is compatible with other human and natural resource values.

Alternatives

(1) To facilitate comprehensive mineral exploration and development.

(2) To restrict mineral exploration and development to those areas which already have been staked or leased.

(3) To limit mineral exploration and development to select claims of known mineral occurrence within presently staked or leased areas.

(a) Alternative 1

Alternative 1 would allow the continued exploration and development of mineral reserves in any region of the study area where such activities did not conflict with another major resource use.

(b) Alternative 2

Alternative 2 would allow mineral exploration and development to occur only in the areas which already have been staked or leased. This alternative would restrict the development of new access roads and allow planners the opportunity to control, to a limited extent, areas of mining activity.

(c) Alternative 3

Alternative 3 would restrict even further the present mining activities in the study area. This alternative advocates the expropriating of mineral claims in regions that give priority to other resource uses. Overall Alternative 3 will only allow minimum development in designated areas of known mineral occurrence. The major

objective of such an alternative would be to protect both the environment and wildlife by restricting extensive exploration and the development of new mining related access corridors.

Potential Land Use Decisions

(1) Mining activity may have to be restricted to those areas along the Jackson Lake road which already have been staked or leased.

(2) Future claims could be permitted only in the event that a claim or lease lapses within the recommended area of development.

(3) The development of mining exploration roads might be confined to those areas which have already been staked along the Jackson Lake road.

Agriculture and Grazing

Goal

To recognize the potential of higher classes of agricultural land.

Alternatives

(1) To permit and encourage the development/continuation of grazing or agricultural land use in suitable areas on crown lands.

(2) To permit and encourage the development/continuation of grazing or agricultural land use on crown land adjacent to areas of designated vehicular access where conflicts do not exist with significant, sensitive wildlife or recreation areas.

(a) Alternative 1

Alternative 1 would allow for the greatest degree of development of this resource. Suitable areas would include those areas of

existing/pending leases as well as other areas of Class 5 agricultural Capability. This alternative could result in either the maintenance or addition of undesireable access roads which would have a strong negative impact on the study area as a unit. In addition, conflicts with other higher priority land uses may arise.

(b) Alternative 2

Alternative 2 provides for the development of grazing and agricultural land use in areas which do not conflict with either significant wildlife areas or recreation-oriented use areas (e.g., campsites, hiking trails, picnic sites). While this alternative gives priority to the specified land uses, many small sites of Class 5 agricultural capability are eliminated.

The need for access trails to agricultural areas might prove disadvantageous to other land use objectives. Thus potential locations are limited to those adjacent to designated vehicular access routes.

Potential Land Use Decisions

(1) Continue existing leases on crown land. The existing leases (grazing) are located between Fish and Louise lakes.

(2) Reserve lands of Class5 agricultural capability which are outside significant wildlife and recreation areas and adjacent to areas of designated vehicular access. This would include a major area west of the northern access route in the Ibex Valley.

(3) Any changes to the existing agricultural/grazing land lease program might emanate from recommendations from a jointly agreed upon federal/territorial agriculture policy. This might, for example, allow for the eventual purchase of lease lands.

Forest Resource Use

Goal

To manage forest resources (sawlog/fuelwood) in a manner that is compatible with other types of resource use.

Alternatives

(1) To limit sawlog/fuelwood extraction to those areas which do not conflict with other resource uses.

(2) To remove fuelwood from potential conflict areas and to stockpile it in areas of limited resource conflict (to be conducted over a one or two year period).

(3) To selectively remove fuelwood from areas of potential conflict over a five year period while continuing to extract from regions of limited resource conflict.

(a) Alternative 1

Alternative 1 would permit the removal of sawlogs/fuelwood from those areas in which there was no other major resource use. In areas of potential conflict, such as in Ibex Pass, (i.e., along the south side of Ibex River) fuelwood could not be removed. The major drawback to this alternative is that it will reduce the potential amount of available fuelwood in close proximity to Whitehorse.

(b) Alternative 2

Alternative 2 would allow for the short-term removal of fuelwood from regions of potential conflict. This is in recognition of the limited long term supply of fuelwood in close proximity to Whitehorse. The extraction process would be under the supervision of forestry personnel and would be completed in the course of one or two years.

(c) Alternative 3

Alternative 3 would allow maximum cutting of sawlogs as well as the extraction of fuelwood year round in regions of limited conflict. This alternative would also promote selective cutting during the fall in other areas of easy access which would normally be recognized as incompatible with other land uses.

Potential Land Use Decisions

(1) Leases might be issued only along the western access road into Ibex Pass.

(2) Current leases in all other locations might be allowed to expire with no option for renewal.

Recreational Use (Activity Areas)

Goal

To provide for a variety of recreational activity areas (e.g., campsites, picnic areas, hiking trails) which cater to both residents and non-residents.

Alternatives

(1) To consider establishing recreational reserves in areas which have potential for a range of recreational activities.

(2) To consider establishing a recreational reserve which facilitates a high level of use and at the same time recognizing the potential for the future development of other recreational sites (i.e., picnic areas, campsites).

(3) To dispense with recreational reserves while continuing to encourage day use activities in areas recognized as having recreational potential.

(a) Alternative 1

Alternative 1 would not support the establishment of any large recreational reserves. Instead it suggests the development of small recreational sites which can be easily maintained. This might include reducing the size of the large recreational reserve established to the east of Mount North Ibex. It might also encourage the development of smaller sites such as in the Jackson Lakes area and the Bonneville Lakes region.

(b) Alternative 2

This alternative would allow for the existence of the large recreational reserve established under the Whitehorse North Land Management Planning Project while also recognizing the potential need for smaller sites such as in the Jackson Lake area and the Bonneville Lakes region.

(c) Alternative 3

This alternative suggests that the idea of a recreational reserve be eliminated in this region. Rather than promoting any one large scale area or a number of smaller areas, extensive recreational activities would continue in suitable areas. Facilities would be quite simple and would include, for example, garbage cans and pit toilets.

Potential Land Use Decisions

(1) To consider utilizing the established Yukon Territorial Government Recreational Reserve as a recreational activity area.

(2) To consider expansion of campground facilities, including an increase in the number of washrooms and other necessary structures.

(3) To allow camping only within designated sites.

(4) To preserve the Scout camp in a manner which promotes its original use.

(5) To advertise the fishing and camping capability of recreation reserves.

(6) To consider the further development of hiking trails, particularly in the Scout Lake area.

(7) To encourage cross-country skiing on the hiking trails and road access routes.

(8) To encourage extended cross-country travel through recreational reserves and to build warmup huts.

Recreational Use (Extensive)

Goal

To allow for a variety of extensive types of recreation (e.g., boating, snowmobiling, horseback riding and small game hunting) which cater primarily to the needs of local residents.

Alternatives

(1) To consider creation of a recreational management zone which would have as a principal management objective extensive recreational use.

(2) To consider development of a number of recreational sites (which would be managed and maintained through government agencies) and which would promote extensive types of recreation activity.

(3) To continue to allow extensive forms of recreation to occur in areas in which they do not conflict with other land uses.

(a) Alternative 1

This alternative supports the establishment of a designated area or region which would promote extensive forms of recreational use. Alt. 1 might also restrict extensive use outside this recognized zone.

(b) Alternative 2

The objective of this alternative would be to promote the development of a set number of extensive use areas which could support a select number of recreational uses. These individual uses would be restricted in other areas if they were considered incompatible (e.g., cross-country skiing versus snowmobile trails). This alternative also supports the involvement of government in monitoring and maintaining these designated extensive use sites.

(c) Alternative 3

Alternative 3 suggests that extensive uses be allowed to occur randomly, providing they do not conflict with any other land use. This potentially would allow the uncontrolled development of extensive land uses as long as they did not compete with other types of land use. The freedom to develop and travel freely would be weighed against the threat of eventual land use restrictions.

Potential Land Use Decisions

(1) Consider the further development of existing trails to encourage both horseback riding and snowmobiling. This would occur in the southern section of the study area and would extend beyond the Jackson Lake Road and along the south end of the Ibex River to Ibex Lake before circling back around Fish Lake.

(2) Consider the further development of hiking trails, particularly around Fish Lake. The latter trails also could be used for snowmobiling.

(3) Consider building a warmup hut on the east side of Fish Lake.

(4) Consider continued small game hunting in the Bonneville Lakes region.

(5) Consider continued encouragement of boating activities in Fish Lake and the Jackson Lakes.

(6) Continue to recognize the need for extensive types of recreation and give preference to these activities over other land uses in select areas.

Wildlife Viewing

Goal

To consider giving wildlife viewing priority in areas which support a high percentage of unique or sensitive wildlife populations.

Alternatives

(1) To consider developing wildlife viewing areas in the Ibex Pass area without the formal establishment of either a park or a game sanctuary.

(2) To consider establishment of a Wildlife Game Sanctuary in the Ibex Pass and its surrounding area.

(3) To consider establishing a Wildlife Park in the Ibex Pass area, one which supports large numbers of Dall sheep, overwintering moose, gyrfalcon and golden eagle.

(a) Alternative 1

Alternative 1 would allow the greatest flexibility in regulat-

ing a land use development in the Ibex Pass area. This alternative would restrict resource developments which would adversely affect unique or sensitive wildlife populations while allowing other land use activities to occur. These land use activities would be regulated by government but would not be restricted by the rigid guidelines of a Park or Game Sanctuary.

(b) Alternative 2

Alternative 2 would permit certain land use activities to occur in the area. These land use activities would be determined by the Yukon Territorial Government and would have to be considered compatible with wildlife viewing. The implementation of this alternative would limit land use activity in the proposed viewing area but would not totally restrict it.

(c) Alternative 3

Alternative 3 would legally eliminate all land uses in this area that were not compatible with wildlife viewing. This alternative would permanently protect the wildlife populations that now frequent Mount Ingram and Mount North Ibex as well as the migration routes of these species. In addition this area could be developed as a local day use attraction for both residents and non-residents. The major drawback is that this alternative would probably eliminate land use activities such as the extraction of fuelwood or the development of a pipeline.

Potential Land Use Decisions

(1) The Park for wildlife viewing would be determined by the critical habitat requirements of each of the affected species.

(2) Limited access might be arranged by degrading the latter half of the existing road to a day-use hiking trail. No other access roads would be permitted.

(3) Interpretive signs could be erected which describe the general ecology of the protected wildlife species.

(4) Wildlife viewing could be restricted to a limited access road, turn around or hiking trail.

Wildlife Resource Use

Goal

To ensure that the harvesting of wildlife resources is conducted in a manner which promotes sustained wildlife populations.

Alternatives

(1) To consider allowing continued harvesting of certain wildlife species by trappers as well as resident/non-resident hunters.

(2) To consider restricting non-resident hunting while continuing to allow both resident hunting and trapping to occur.

(3) To consider continued limited trapping while restricting both resident and non-resident hunting activities.

(a) Alternative 1

This alternative supports continued trapping and hunting (resident and non-resident) within certain designated wildlife resource management zones. The level of hunting (resident/non-resident) and resident trapping would be determined by local wildlife officials.

(b) Alternative 2

The objective of this alternative would be to promote only

resident hunting and trapping within designated wildlife management zones. The principle target species as well as the level of resident hunting and trapping would continue to be determined by local wildlife officials.

(c) Alternative 3

Alternative 3 suggests that hunting would be restricted for both residents and non-resident and that only limited trapping be allowed within designated wildlife management zones. This alternative would enhance the overall wildlife population of certain species and would increase the wildlife viewing potential of the entire area. The area would continue to be managed by local wildlife officials.

In the event that certain wildlife species become too abundant, limited harvests would be permitted by wildlife officials.

Potential Land Use Decisions

(1) Consider the establishment of new boundaries for outfitting area number 17.

(2) Consider restricting any land use activity which conflicts with either resident hunting or trapping within designated wildlife management zones.

(3) Ensure that there be continued management of wildlife populations by local wildlife officials.

Fisheries Resource Use

Goal

To protect important spawning and rearing habitat as well as maintaining existing fish populations.

Alternatives

(1) To continue to restrict the harvesting of anadromous fish (salmon) stocks while allowing the controlled removal of all true freshwater fish species.

(2) To allow limited removal of anadromous fish species while also allowing the removal of all true freshwater fish species.

(3) To allow the selective removal of all true freshwater and anadromous fish species.

(a) Alternative 1

Alternative 1 would allow the continued harvest of all true freshwater sport fish (through present regulatory controls established by the Department of Fisheries and Oceans) while also continuing to protect migrating chinook salmon in areas such as Arkell Creek and Ibex River.

(b) Alternative 2

Alternative 2 would allow salmon fishing in areas such as Ibex River and Arkell Creek (through regulatory controls established by the Department of Fisheries and Oceans) as well as the controlled harvest of other sport fish.

(c) Alternative 3

Alternative 3 would restrict the removal of any fish species which was considered threatened either by overfishing or natural phenomenon (i.e., low rates of regeneration, limited distributions). The status of the individual fish stocks would be determined as well as regulated by the Department of Fisheries and Oceans.

Potential Land Use Decisions

(1) The continued enhancement of landlocked water bodies with favoured recreational fish species (e.g., Scout Lake)

(2) The monitoring of fish stocks to ensure that overharvesting does not occur.

(3) The restriction of any commercial or recreational fishing in regions where other land uses have been given priority.

(4) The monitoring of water quality in areas of cottage, residential or mineral use (e.g., Jackson Lakes area).

(5) To work with staff of Yukon Electrical Company in order to maintain current fish stocks.

Pipeline

Goal

To construct a pipeline in the study area that is compatible with human and natural resource values. Implicit in this goal is the assumption that it is possible to route a pipeline in such a way that it can be compatible with these values. If this were not the case an alternative routing for the pipeline would be required.

Alternatives

(1) To consider routing the pipeline via the Ibex Valley routing.

(2) To consider routing the pipeline via Scout Lake routing.

(a) Alternative 1

The Ibex Valley pipeline route would allow Foothills Pipe Lines to follow the company's preferred routing. A 40m cleared corridor

would be necessary. This corridor would cross through the entire study area. The principal concerns would include the potential effects on sensitive wildlife especially during the construction period of eighteen months and in the event of a pipeline rupture or leakage requiring emergency maintence. Future options concerning the proposed Dempster Lateral Pipeline would be lost. Archaeological sites would be disturbed. Current quartz lease and recreation areas would be affected. Finally more access to this area will be possible on at least a temporary basis.

(b) Alternative 2

The pipeline routing followed would cut south through the Scout Lake Recreational Reserve and join the Ibex routing for the eastern half of the study area. Alternative 2 has the same concerns as Alternative 1 except that the wildlife areas are not quite so sensitive. However, by using this route the pipeline crosses through the recreational reserve which has both existing and potentially significant recreational resources.

Potential Land Use Decisions

(1) Routing would have to avoid recreation sites.

(2) Routing should be selected to minimize impact on the Louise-Jackson Lakes and cottage development.

(3) Archaeological site procedures would have to be followed. The pipeline proponent would be encouraged to assist in the development of an Archaeological Interpretive site.

(4) Time windows for construction would have to be in accordance with the optimum timing for the least disturbance of significant wildlife and raptors.

(5) According to the present pipeline routing the quartz lease areas would conflict with the pipeline. The mining corridor area would require reduction to form a single block south of the pipeline right-of-way. Compensation might have to be provided by Foothills Pipe Lines (South Yukon) Limited.

(6) The crossing of Yukon Electrical Company facilities by the pipeline does not pose a major technical problem. The two land users would need to work out an agreement concerning the crossing.

(7) Where recommended road routes are adjacent to the pipeline, the cost of upgrading the roads might have to be paid by Foothills Pipe Lines (South Yukon) Limited.

(8) Where pipeline construction access routes are outside designated road areas, the construction routes should be either removed or completely blocked by Foothills Pipe Lines (South Yukon) Limited. This is particularly critical at extensions or intersections to existing or designated areas.

(9) It is suggested that interpretive signage might be sponsored by Foothills Pipe Lines (South Yukon) Limited.

(10) Explore possibilities of limiting views of long straight right-of-way cut areas. Perhaps boulder gardens with ground shrubs would be utilized, for example.

(11) Emergency access to pipeline by helicopter only, except in areas adjacent to designated vehicular access routes.

IV. POTENTIAL RESOURCE MANAGEMENT STRATEGIES

INTRODUCTION

A number of strategies for the future management of the Ibex Pass area are possible, given the information presented heretofore on baseline conditions and a series of goals and alternatives for individual resource management. These strategies may differ considerably in their overall direction and in the land use decisions which flow from them. However, all are considered to be real possibilities which reflect the realities of biophysical conditions and human occupancy, land use and land management.

To provide a perspective on the range of management possibilities two extremes in management strategy are presented. One puts considerable standing in landscape and species conservation, places distinct limitations on the types of land use that could be entertained and most conveniently may be termed a conservation management strategy. At the other end of the spectrum of potential strategies is an arrangement which emphasizes the full developmental potential of the resources of the study area and which seeks to optimize that potential within the limits of sound resource management. This most conveniently may be described as the development management strategy.

Between these two relative extremes lie a range of other possibilities for integrated resource management. These provide for combinations of aspects of the two extremes provided that such combinations assuredly are compatible in a resource management sense. There is little worth, for example, in advocating combinations of land uses which are patently ill-suited to each other and are known to be so. For example, advocating extensive, non facilities-oriented recreational activities such as cross-country skiing or hiking in concert with intensive mining exploration and/or development ultimately could only lead to user conflict and reduced effectiveness of the selected resource management strategy.

For this study four resource management strategies have been prepared. Two represent the extremes set out above; the others reflect intermediate choices. In each of the resource management strategies presented there is reference to which of the alternatives for management of individual resources (set out in Chapter III) would be most appropriate for that particular strategy. The intent in this is to show what lines of resource management decisions would have to be made were a particular strategy selected. This procedure also facilitates the setting out of concept plans (Chapter V) which demonstrate possible ways in which an overall resource management strategy and its land use implications may be articulated on the ground.

RESOURCE MANAGEMENT STRATEGIES

Brief descriptions are given of possible resource management strategies. These descriptions contain first, an overview of the principal management goals for the strategy, followed by reference to the applicable alternatives from Chapter III for individual resource management. The strategies are presented sequentially from least to greatest development.

Strategy No. 1: Conservation/Recreation Orientation

The first strategy places considerable emphasis upon the conservation of the study area's renewable natural resources and its landscape values. To this end developments of any kind would be severely restricted, especially those associated with non-renewable resource extraction, and such activities as would be permitted would be extensive rather than intensive. Land use emphasis would be placed on the area's capabilities from the standpoint of outdoor, non facilities- oriented recreation and the protection of important wildlife range and aesthetic or scenic values. Of all strategies this one would be the most conducive to placing strict limitations on existing land use practices, even to the extent of cancelling existing arrangements in instances where these were thought to be incompatible with management objectives.

The following resource management objectives would be in effect:

Archaeological Resources: to identify and develop mechanisms for the protection of areas of archaeological significance.

Residential/Cottage Land Use: to assess the merits of perpetuating existing residences and cottages in the area.

Hydroelectric Power: to permit the continuation of hydro-electric production utilizing existing facilities in the study area.

Mineral Resource Use: to limit mineral exploration and development to select claims of known mineral occurrence within presently staked or leased areas.

Agriculture/Grazing: to permit and encourage the development/continuation of grazing or agricultural land use on crown land adjacent to areas of designated vehicular access where conflicts do not exist with significant, sensitive wildlife or recreation areas.

Forest Resource Use: to limit sawlog/fuelwood extraction to those areas which do not conflict with other resource uses.

Recreational Use (Activity Areas): to consider establishing a recreational reserve which facilitates a high level of use and at the same time recognizing the potential for the future development of other recreational sites.

Recreational Use (Extensive): to consider creation of a recreation management zone which would have as a principal management objective extensive recreational use.

Wildlife Viewing: to consider establishing a Wildlife Park in the Ibex Pass area.

Wildlife Resource Use: to consider continued limited trapping while restricting both resident and non-resident hunting activities.

Fisheries Resource Use: to continue to restrict the harvesting of anadromous fish (salmon) stocks while allowing the controlled removal of all true freshwater fish species.

Pipeline: not applicable. Consideration of potentially routing pipeline through the area would require the most stringent evaluation of the implications of placing and operating the pipeline in a region whose principal management strategies were directed to conservation and recreation.

Strategy No. 2: General Conservation

Strategy No. 2 differs from Strategy No. 1 more in terms of emphasis than actual management direction. This strategy also recognizes the natural values of the study area, but it is intended to be less restrictive in its interpretation of permissable land use activities. The principal difference from those resource management objectives identified for Strategy No. 1 would be as follows:

Recreational Use (Extensive): to consider development of a number of recreational sites which would promote extensive types of recreation activity.

Management Strategy No. 2 also would not be conducive to the routing of a pipeline through the study area. While not totally eliminating such a possibility the disadvantages to the overall direction of management objectives by including a pipeline would have to be judiciously weighed.

Strategy No. 3: Limited Development

Strategy No. 3 is one which permits greater latitude in the selection of permissible land uses in the study area. It is less conservative in its interpretation of the worth of landscape and non-renewable resources values and is more sympathetic to the prospects of sustained yield of renewable resources. It gives greater recognition to opportunities for non-renewable resource extraction, but continues to recognize critical areas from the standpoint of wildlife resources.

The principal departures from management objectives identified in Strategies 1 and 2 would be as follows:

Archaeological Resources: to identify and to develop mecharisms for the protection of artifacts of archaeological significance. Preserve archaeological sites only in the case of exceptional significance and/or strong potential for development of an interpretive/educational role.

Residential/Cottage Land Use: to assess the merits of permitting or restricting additional seasonal/permanent residences while recognizing the development rights of individuals now possessing titled lots.

Mineral Resource Use: to restrict mineral exploration and development to those areas which already have been staked or leased.

Forest Resource Use: to remove fuelwood from potential conflict areas and to stockpile it in areas of limited resource conflict.

Wildlife Viewing: to consider establishment of a Wildlife Game Sanctuary in the Ibex Pass and it surrounding area.

Wildlife Resource Use: to consider restricting non-resident hunting while continuing to allow both resident hunting and trapping to occur.

Fisheries Resource Use: to allow limited removal of anadromous fish species while also allowing the removal of all true freshwater fish species.

In addition extensive recreational use would revert to the alternative identified for Strategy No. 1; that is, creation of a recreational management zone.

Strategy No. 3 recognizes the opportunity to build a pipeline through the study area via the Ibex Valley route, but subject to strictly enforced guidelines. Introduction of the pipeline probably would require adjustments to concept plans for a "without pipeline" management strategy and these adjustments are demonstrated in the next chapter.

trategy No. 4: Optimum Development

The final strategy represents the optimum development that would be possible in the study area with accompanying costs in the way of landscape and habitat modification, potential for resource use conflicts and attrition upon renewable resource stocks. These costs might be expected notwithstanding the existence of a management mechanism and management plan.

The set of management objectives flowing from this strategy would be quite distinct, as follows:

Archaeological Resources: to identify and to develop mechanisms for the protection of artifacts of archaeological significance.

Residential/Cottage Land Use: to assess the merits of permitting or restricting additional residences and additional cottage lots based upon future demands.

Hydroelectric Power: to permit the expansion of hydroelectric production in the future subject to appropriate recognition of the resource capabilities and land uses of affected areas.

Mineral Resource Use: to facilitate comprehensive mineral exploration and development.

Agriculture and Grazing: to permit and encourage the development/continuation of grazing or agricultural land in suitable areas on crown land.

Forest Resource Use: to selectively remove fuelwood from areas of potential conflict over a five-year period while continuing to extract from regions of limited resource conflict.

Recreational Use (Activity Areas): to dispense with recreational reserves while continuing to encourage day use activities in areas recognized as having recreational potential.

Recreational Use (Extensive): to coninue to allow extensive forms of recreation to occur in areas in which they do not conflict with other land uses.

Wildlife Viewing: to consider development wildlife viewing areas in the Ibex Pass area without the formal establishment of either a park or a game sanctuary.

Wildlife Resource Use: to consider allowing continued harvesting of certain wildlife species by trappers as well as resident/non-resident hunters.

Fisheries Resource Use: to allow limited removal of anadromous fish species while also allowing the removal of all true freshwater fish species.

Pipeline: to consider routing the pipeline through the study area.

A summary of the resource management objectives for each strategy and numbered according to their presentation in Chapter III is set out in Table 12.

TABLE 12
INDIVIDUAL OBJECTIVES FOR RESOURCE MANAGEMENT STRATEGIES

TRATEGY NUMBER	ARCHEO-LOGICAL RESOURCES	RESIDENTIAL/ COTTAGE LAND USE	HYDRO-ELECTRIC POWER	MINERAL RESOURCE USE	AGRI-CULTURE/ GRAZING	FOREST RESOURCE USE	RECREATIONAL USE (ACTIVITY AREAS)	RECREATIONAL USE (EXTEN-SIVE)	WILDLIFE VIEWING	WILDLIFE RESOURCE USE	FISHERIES RESOURCE USE
1	1	1	1	3	2	1	2	1	3	3	1
2	1	1	1	3	2	1	2	2	3	3	1
3	3	2	1	2	2	2	2	1	2	2	3
4	2	3	2	1	1	3	3	3	1	1	2

ote: Numbers relate to alternatives for resource management set out in Chapter III

V. CONCEPT PLANS

INTRODUCTION

In keeping with the objectives set out for the four management strategies in Chapter III a series of related concept plans has been prepared. This set of plans therefore stretches the ganut from least to greatest development, from a stress upon landscape, habitat and species conservation to optimized development. One of the concept plans (Nos. 3 and 4) is shown in both a "with" and "without pipeline" context, to suggest the types of adjustments that would be required were the pipeline to be introduced to the area.

In creating the concept plans some recognition was given to the fact that two distinct groups could utilize the study area, local users and visitors to the region. The study area naturally lends itself to providing opportunities for each of these groups in two broad geographical areas.

The northwest sector of the study area, with its potential for wildlife viewing, recreation and interpretive facilities, seems more oriented to visitor use. The southeast sector is in proximity to Whitehorse and it is already more developed for mining, cottages, grazing, hydroelectric and recreation facilities. This sector would seem to more appropriately cater to local user needs.

To facilitate concept planning a broad zoning-based approach has been utilitzed to facilitate conceptual placement of potential activities. And for each concept plan an accompanying map of potential activities has been included.

ZONING

The parameters of zones in the concept plans are briefly set out below. The suggestions are indicative rather than specific, in keeping with the requirements of a concept plan.

Park or Sanctuary for Wildlife Viewing

This park or sanctuary would serve two main purposes. It would protect some of the sensitive wildlife raptors and their respective habitats that are found in this area. In addition the park or sanctuary would attract visitors to view wildlife. The cliffs of North Mount Ibex and Mount Ingram would provide a dramatic backdrop for the viewing of Dall sheep. Viewing would take place from an upgraded, existing four wheel drive route. However, much of this route would be closed to vehicles and rather serve the purpose of a biking/skiing trail. In order to preserve the wildlife viewing opportunities, no other trails or roads have been included in this area.

The development of wildlife and archaeological interpretive sites would be a definite asset to this park or sanctuary and its visitors. It should be noted that the park contains approximately 56 known archaeological sites.

Wildlife Management Zone

The wildlife management zone would cover a substantial part of the study area. As such it would play an important role as a buffer between uses, some of which potentially may be incompatible with each other. The zone is one in which hunting, trapping and possibly outfitting could take place. Although the zone is an extensive one most of the concept plans do not provide for much to the way of additional access routes because of the potential management difficulties perceived for all types of management strategies were existing access to the study area greatly enhanced.

Recreation Reserve Zone

The existing Yukon Territorial Government Recreation Reserve could continue to be used for recreation purposes. The existing facilities include trout-stocked Scout Lake, canoeing, campsites and

picnic areas. Additional features could include a hiking trail and warmup hut. The addition of some campsites, washrooms and picnic areas would serve two purposes. It would allow the continuing utilization of this area by Scouts. In addition facilities would be provided for visitors passing through this area en route to the Ibex Park or Game Sanctuary.

The road located in the reserve may require upgrading. It would be suitable for cross-country skiing as well.

Recreational Management Zone

The recreation management zone combines a number of recreation oriented areas which have a priority in this zone. The area includes Fish Lake and the Jackson Lakes area.

Day use recreation facilities including boating, picniking, fishing, hiking, horseback riding and snowmobiling could be encouraged here. Hunting small game animals might be permitted in the Bonneville Lakes area.

A number of cottage/residential lots exist in this area with only a few developed cottages. The existing lots could remain and be developed. However, in order to preserve the future recreational use in the area by the general public, there would have to be a decision as to whether other cottages or residential lots should be located here.

Yukon Electrical Company has facilities on Fish Lake and the Jackson Lakes area. Importantly every effort would have to be made to ensure that these facilities and existing or proposed recreational activities were not in conflict.

Grazing Area

The grazing area in the north has been located to preserve suitable lands for that purpose. This area is not cleared at the present time. The grazing area/areas within the recreation management zone include existing grazing leases. These leases are currently a valuable tie-in to the recreation function of this area by providing an area for grazing horses used for the horseback riding rental facility.

Mining Corridor

The mining corridor contains the majority of mining-related activities in this area. A utility road running through the corridor could continue to service this area.

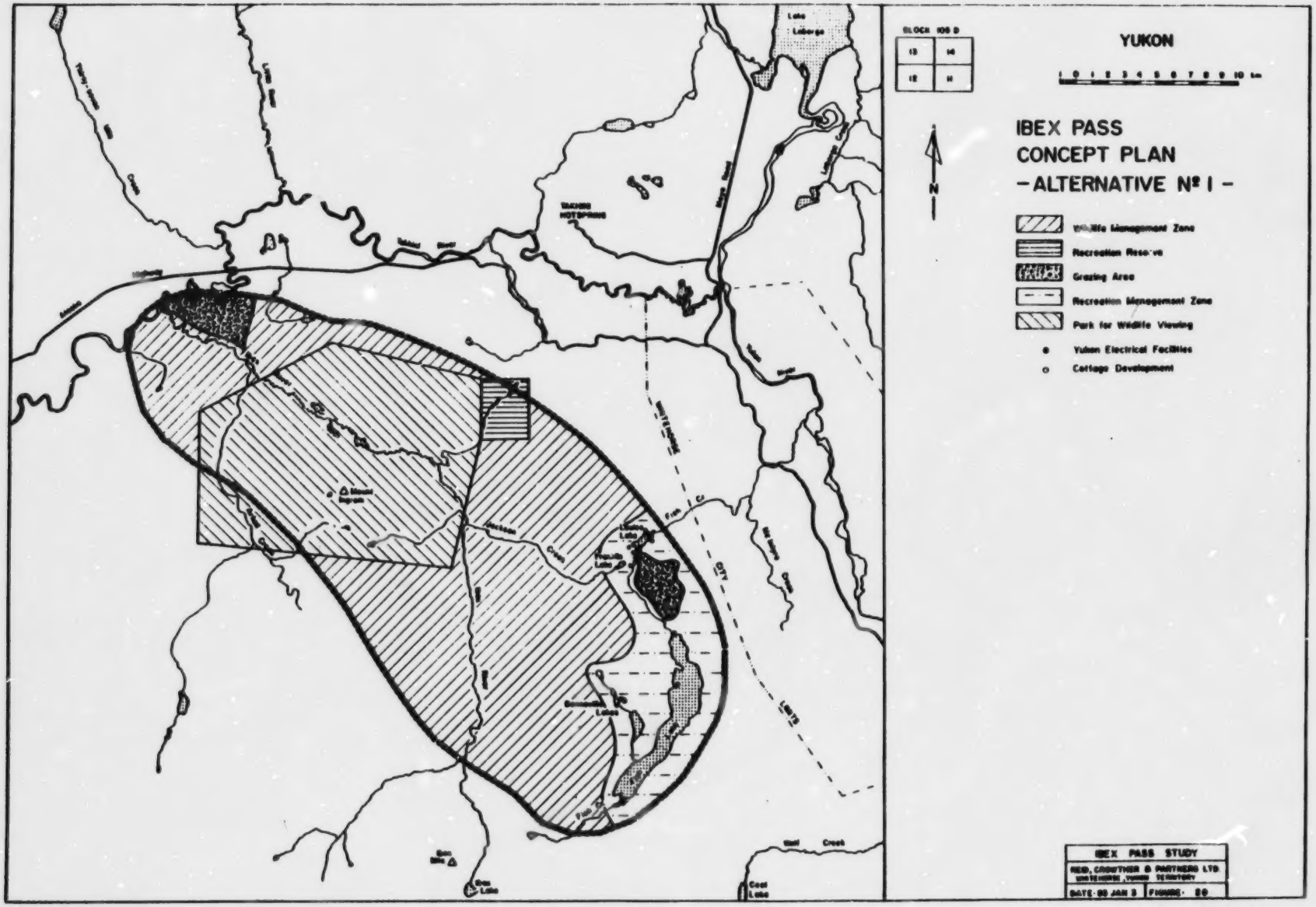
CONCEPT PLANS

Five concept plans and associated maps of potential activities are presented in Figures 20 to 29 inclusive. These concept plans reflect a gradual transition from emphasis upon conservation and very limited development in Figures 20 to 23 inclusive, through to optimized development in Figures 28 and 29. Figures 24 and 25 conceptualize an intermediate form of development and in Figures 26 and 27 Concept Plan No. 4 identifies what lines of changes might be required if the pipeline were introduced to management strategy. The principal differences between Concepts 3 and 4 are the following:

- In crossing the recreation management zone, the pipeline would go through part of the key recreation area of Jackson Lakes. To help compensate for the effects on these facilities, the eastern edge of the mining corridor has been reduced to provide more recreation area.
- Also within the recreation management zone, some of the hydro facilities will be crossed by the pipeline. It has been estimated that disruption to the hydroelectric function will be very brief, perhaps one day.

- The pipeline will cross directly through the grazing area. Concept Plan No. 4 reduces the grazing area to reflect the actual leases only. Thus the conflict of uses would be avoided.

- Because of the potential conflict between pipeline and mining uses, in Concept Plan No. 4 the size of the mining corridor has been reduced so that the pipeline corridor will be outside the northern boundary of the corridor.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Grazing Area
Recreation Management Zone
Park for Wildlife Viewing
Yukon Electrical Facilities
Cottage Development
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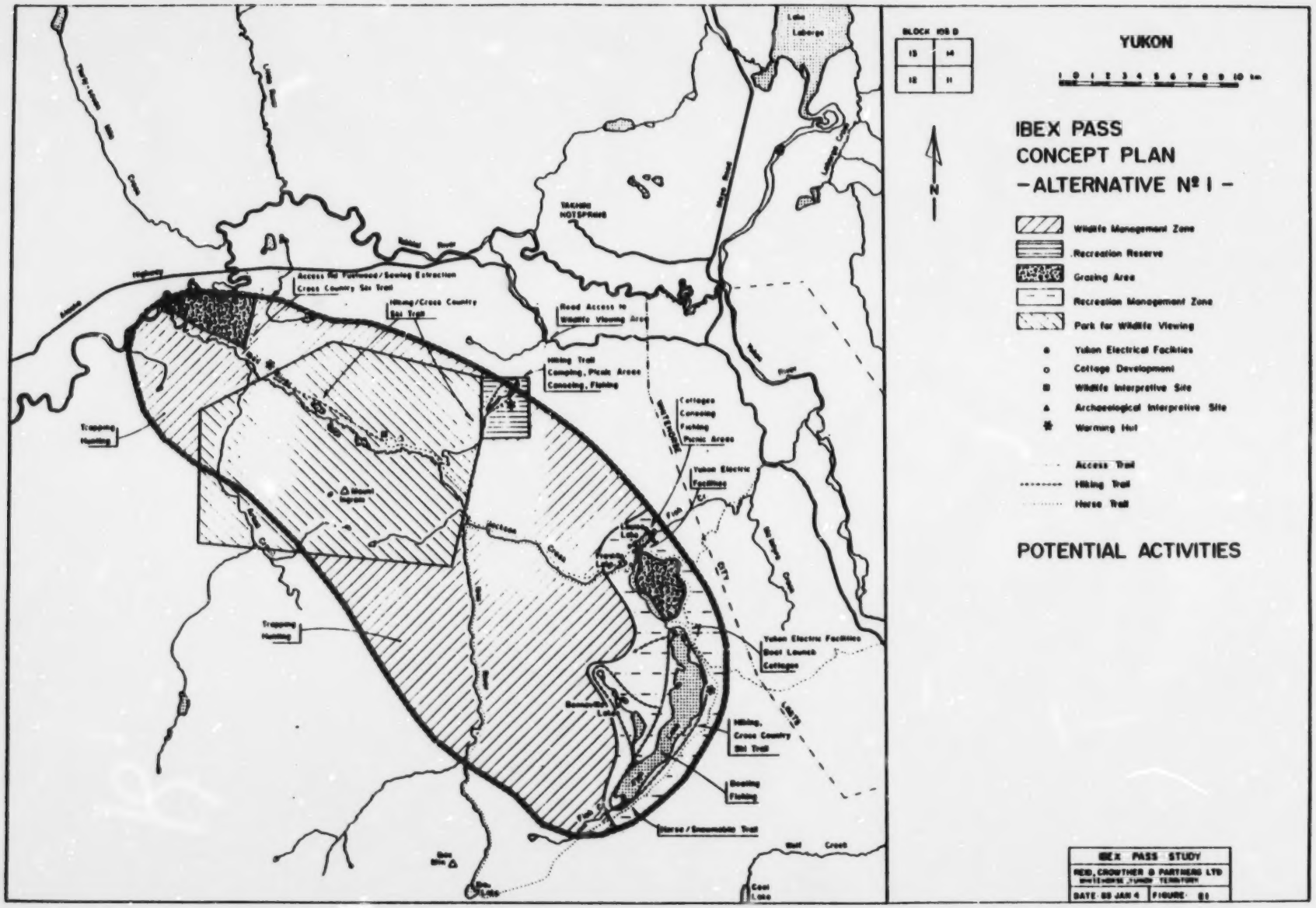
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Wildlife Interpretive Site
Archaeological Interpretive Site
Warming Hut
Access Trail
Hiking Trail
Horse Trail
POTENTIAL ACTIVITIES
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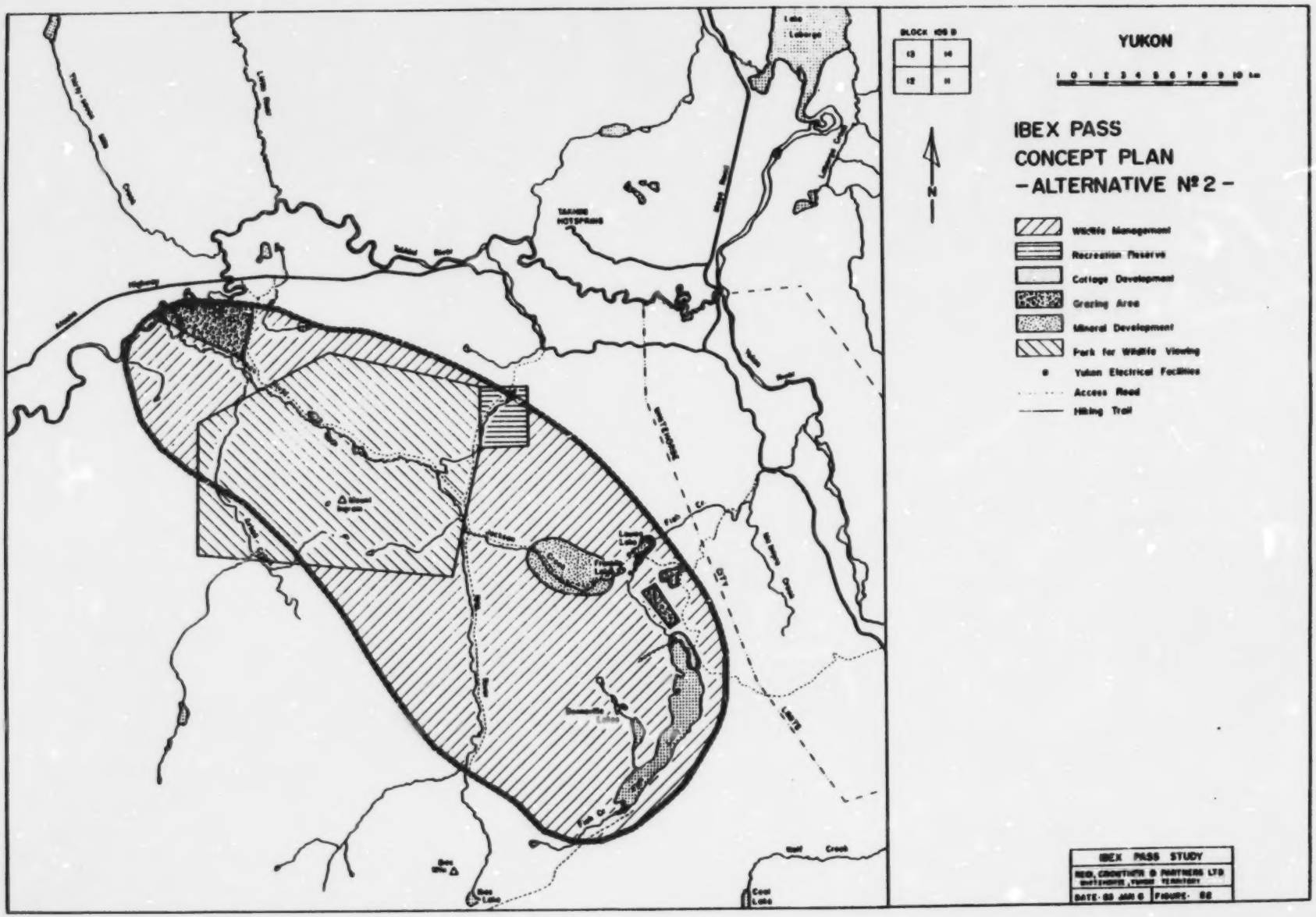
FIGURE: 61


YUKON
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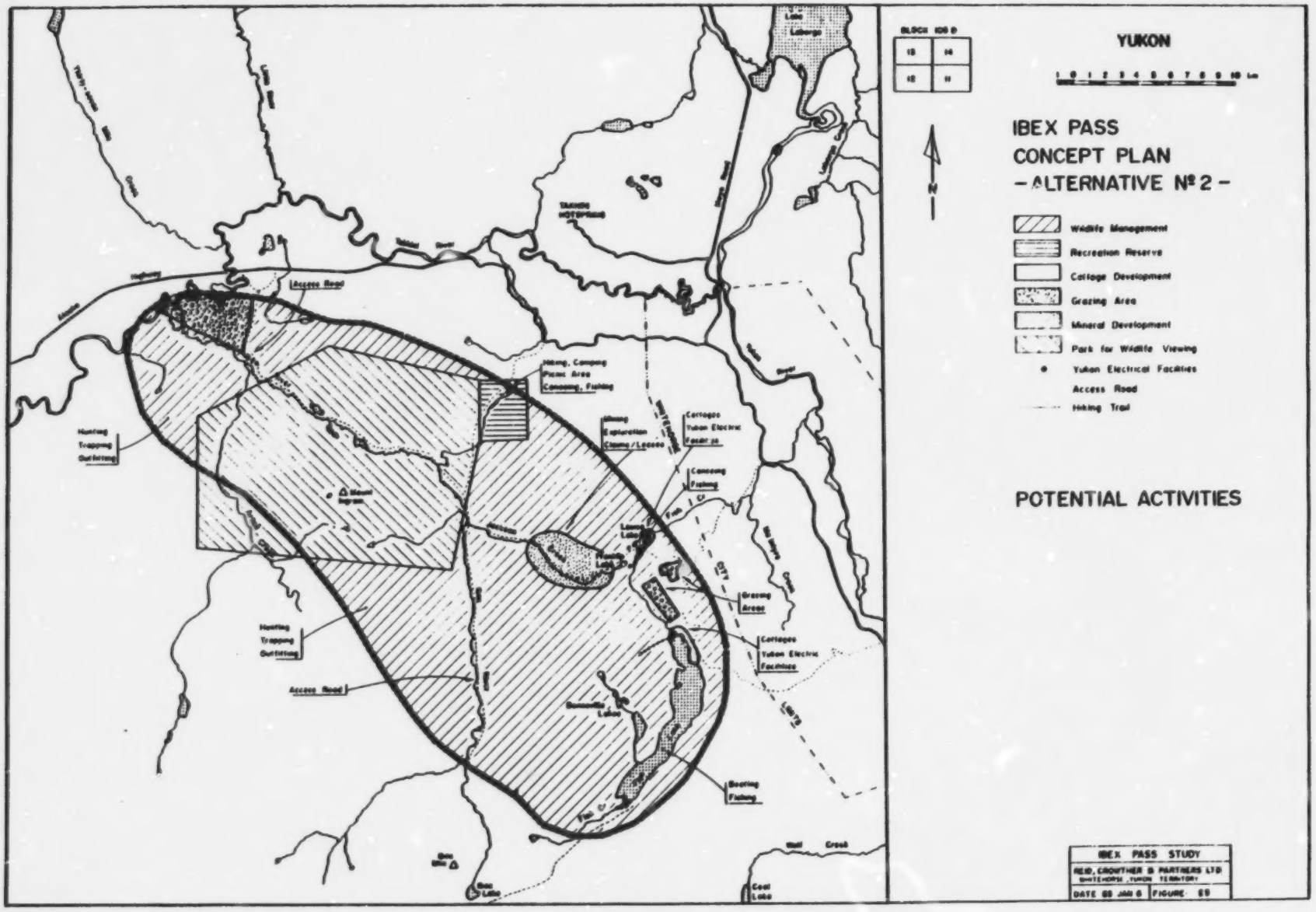
-ALTERNATIVE Nº 2-
Wildlife Management
Recreation Reserve
Cottage Development
Grazing Area
Mineral Development
Park for Wildlife Viewing
Yukon Electrical Facilities
Access Road
Hiking Trail
N
IBEX PASS STUDY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Yukon Electrical Facilities
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Hiking Trail
POTENTIAL ACTIVITIES
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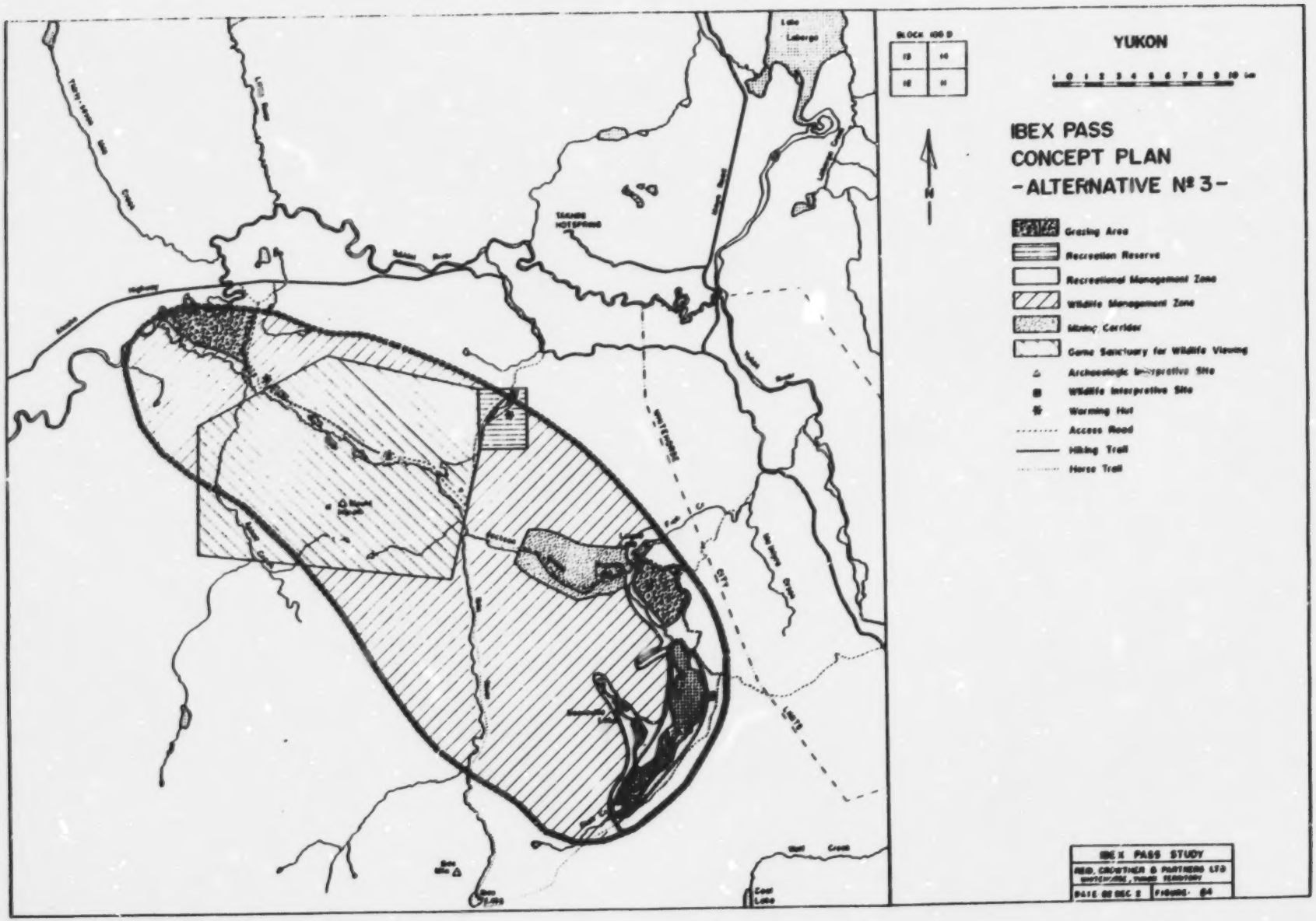
REID, CROUTHER & PARTNERS LTD
WHITEHORSE, YUKON TERRITORY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Grazing Area
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Wildlife Management Zone
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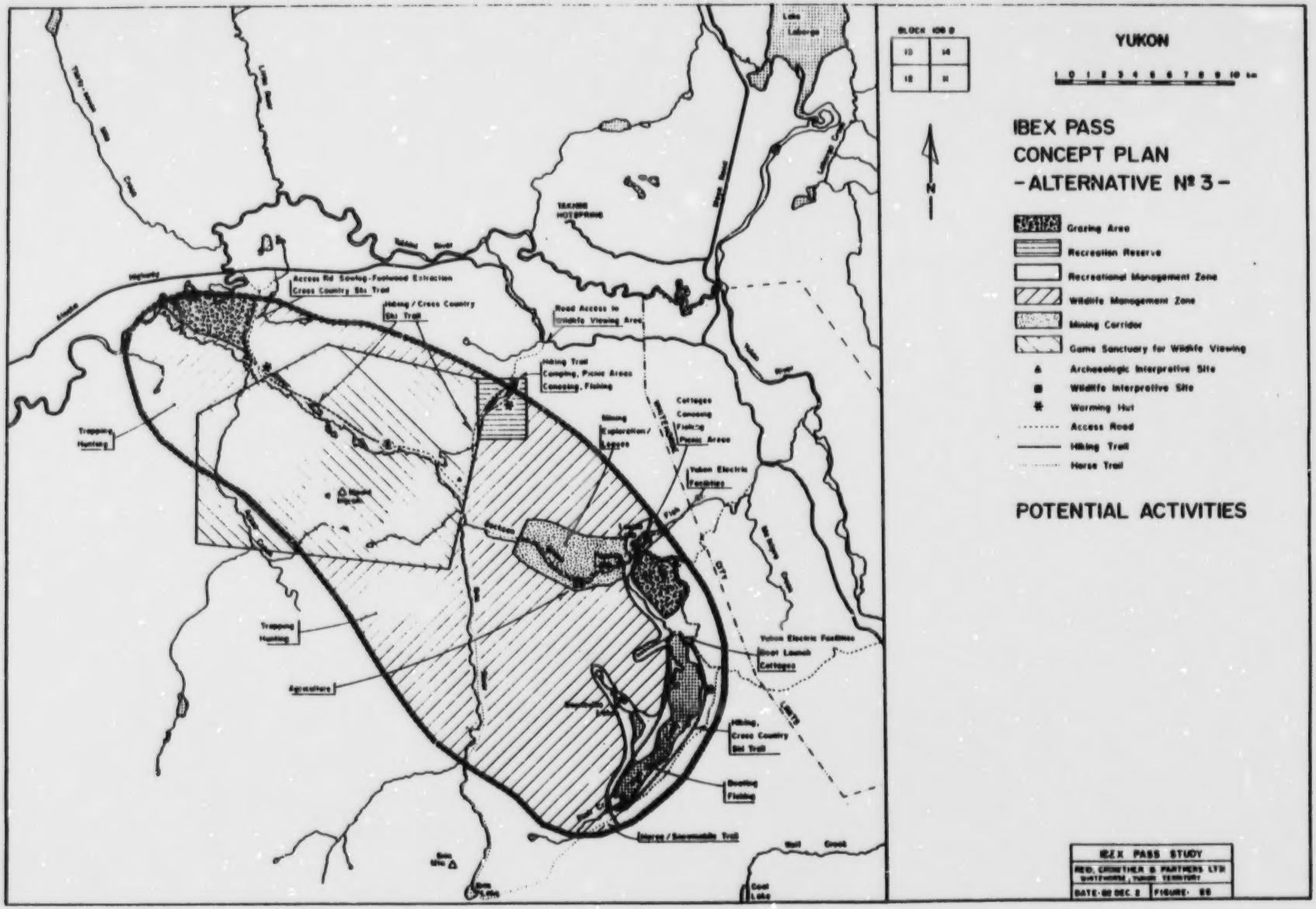
Archaeologic Interpretive Site
Wildlife Interpretive Site
Warming Hut
Access Road
Hiking Trail
Horse Trail
IBEX PASS STUDY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Wildlife Management Zone
Mining Corridor
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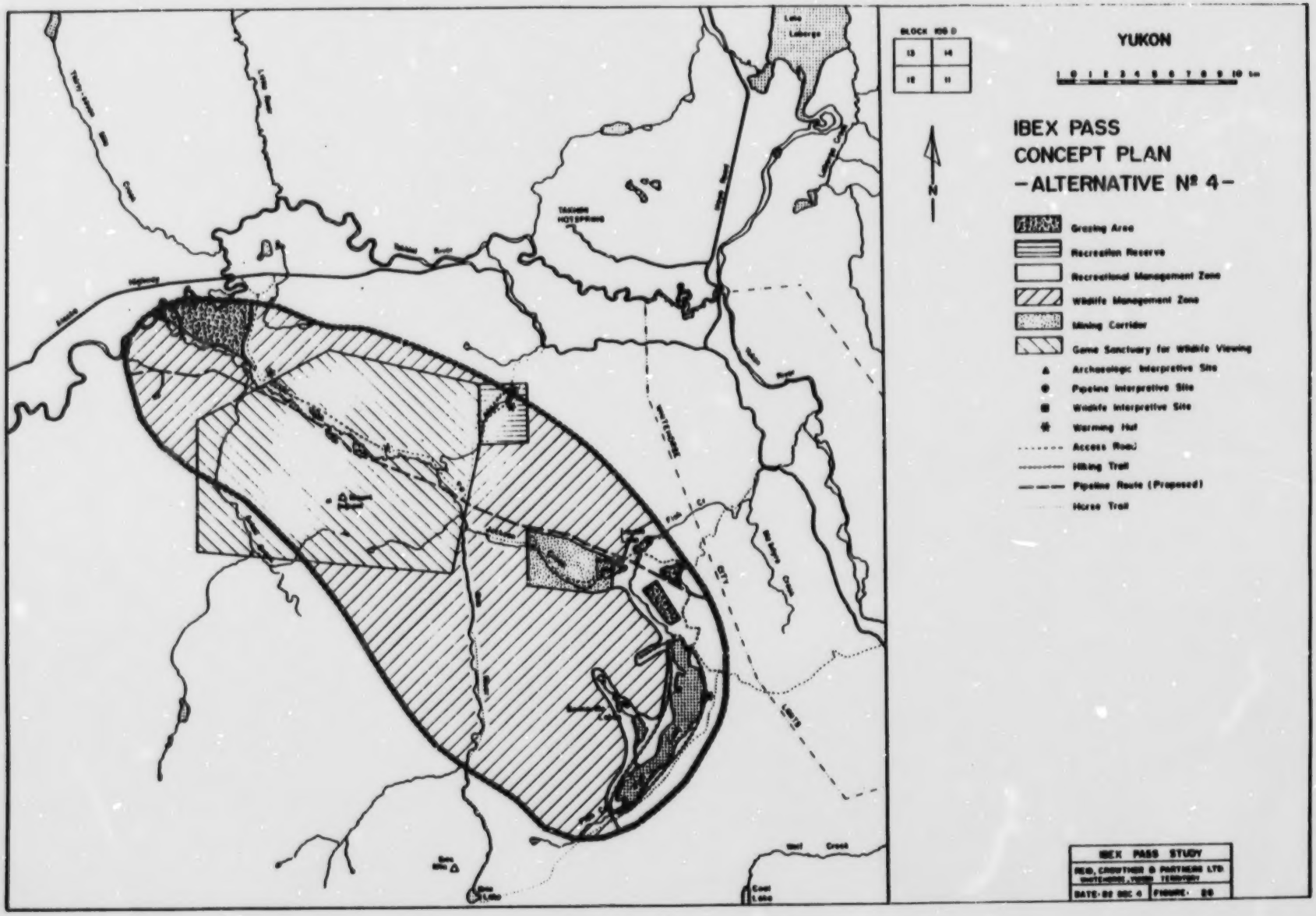
Archaeologic Interpretive Site
Wildlife Interpretive Site
Warming Hut
Access Road
Hiking Trail
Horse Trail
POTENTIAL ACTIVITIES
Access Rd Sawlog-Fuelwood Extraction
Cross Country Ski Trail
Hiking / Cross Country Ski Trail
Road Access to Wildlife Viewing Area
Hiking Trail
Camping, Picnic Areas
Canoeing, Fishing
Cottages
Canoeing
Fishing
Picnic Areas
Mining Exploration / Leases
Yukon Electric Properties
Trapping
Hunting
Agriculture
Yukon Electric Facilities
Boat Launch
Cottages
Hiking, Cross Country Ski Trail
Shooting
Fishing
Horse / Snowmobile Trail
IBEX PASS STUDY
RED, CROWTHER & PARTNERS LTD
WHITEHORSE, YUKON TERRITORY
DATE: 80 DEC. 2
FIGURE: 88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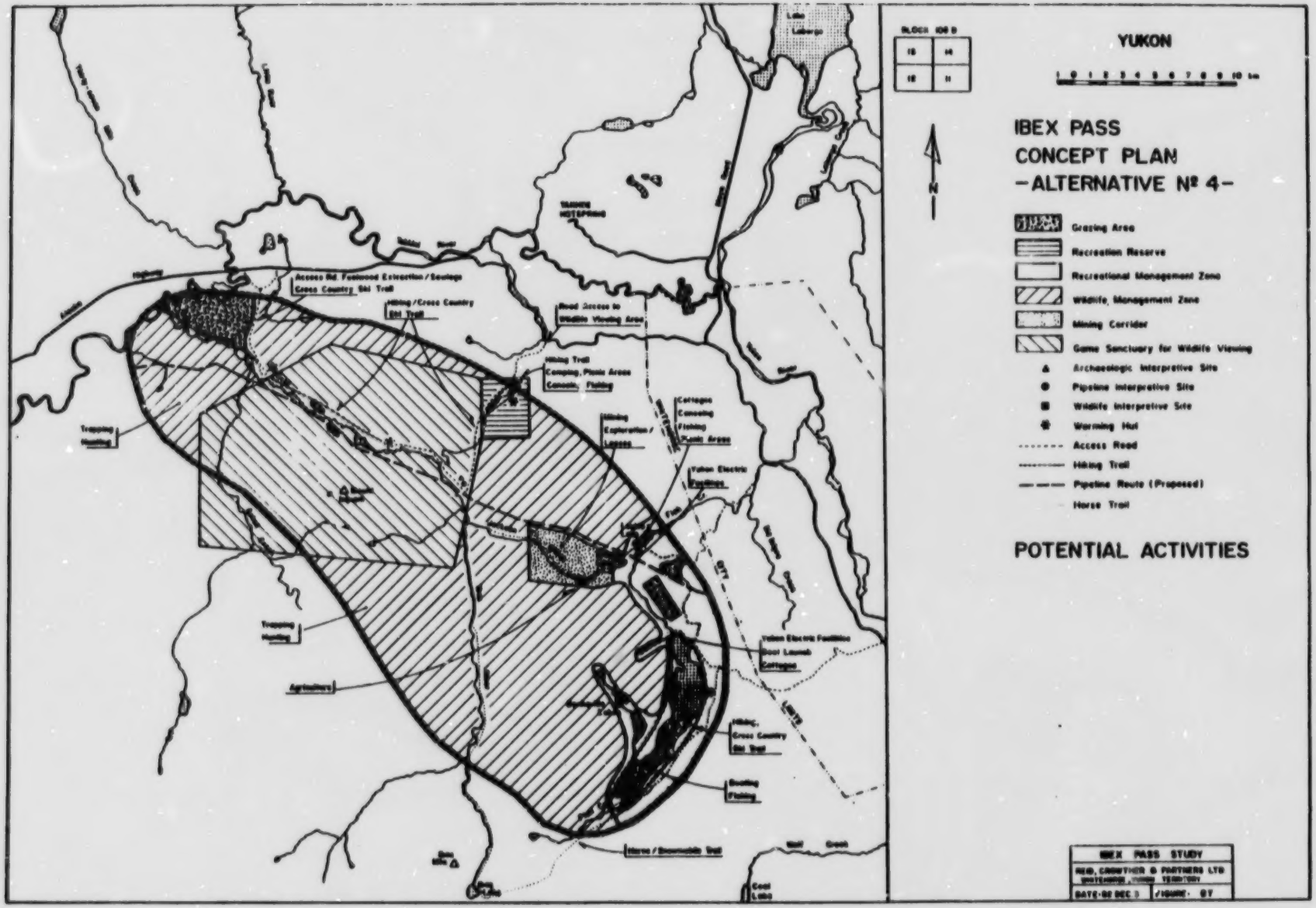
Wildlife Management Zone
Mining Corridor
Game Sanctuary for Wildlife Viewing
Archaeologic Interpretive Site
Pipeline Interpretive Site
Wildlife Interpretive Site
Warming Hut
Access Road
Hiking Trail
Pipeline Route (Proposed)
Horse Trail
IBEX PASS STUDY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Wildlife Management Zone
Mining Corridor
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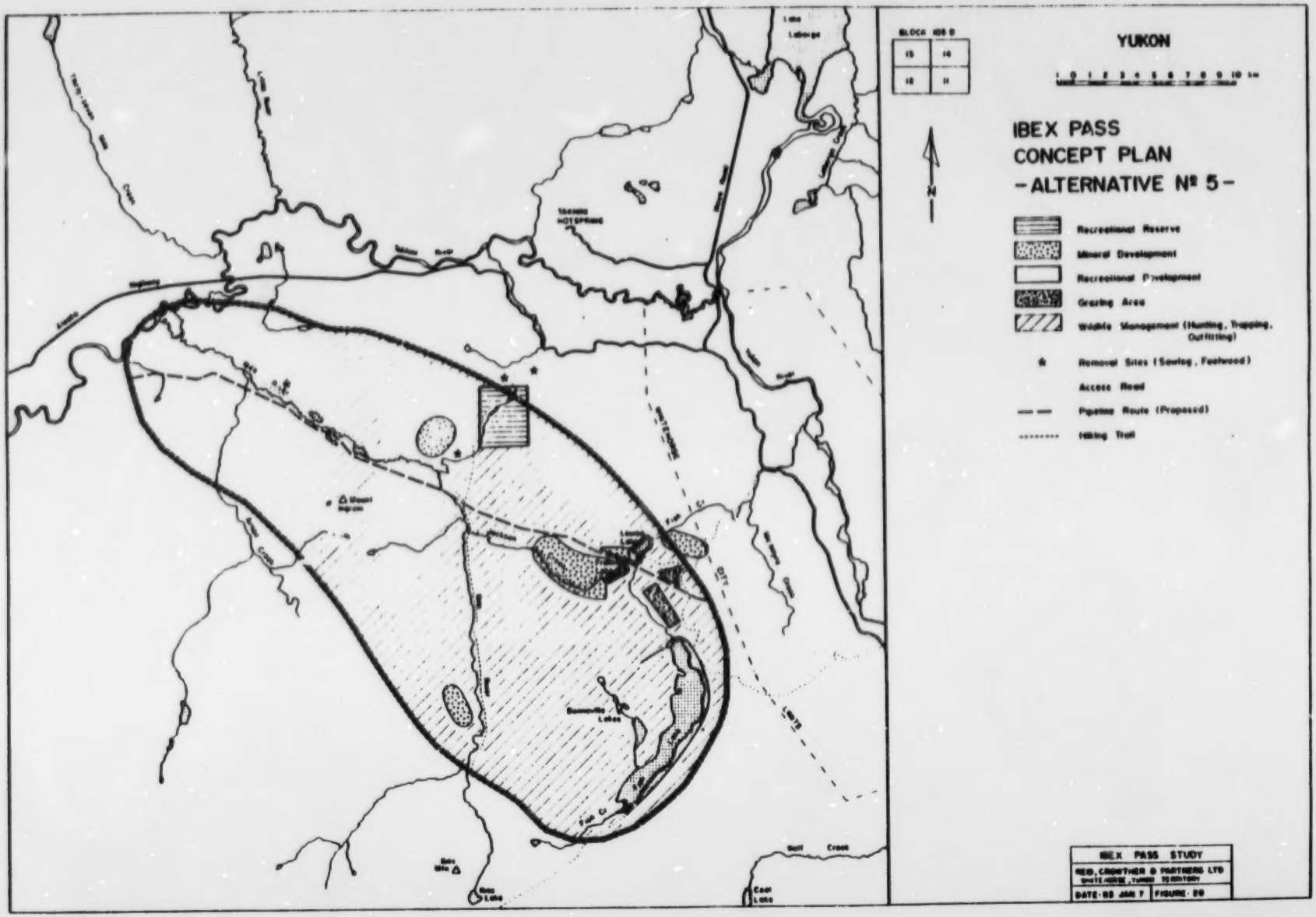
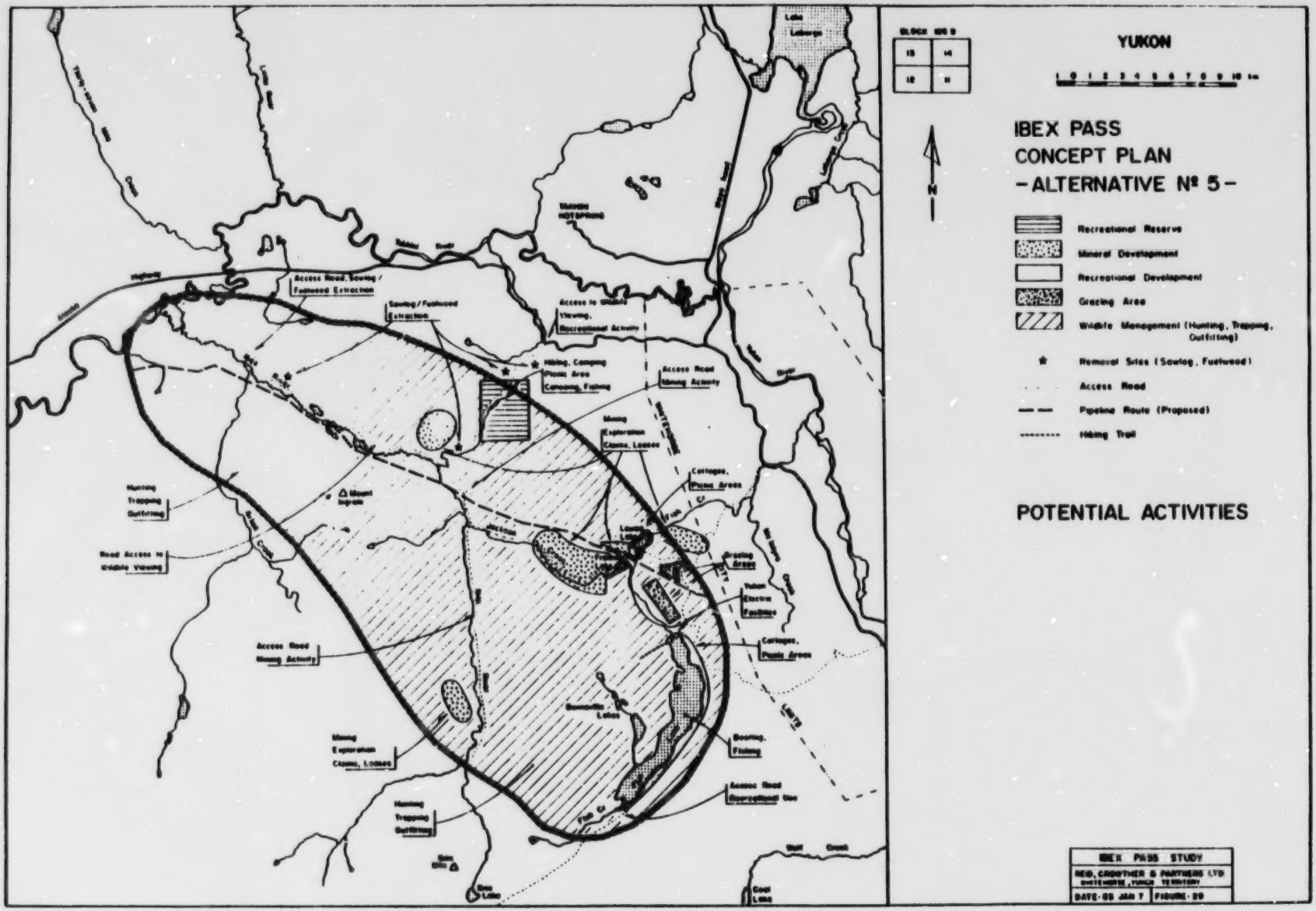
Archaeologic Interpretive Site
Pipeline Interpretive Site
Wildlife Interpretive Site
Warming Hut
Access Road
Hiking Trail
Pipeline Route (Proposed)
Horse Trail
POTENTIAL ACTIVITIES
IBEX PASS STUDY


YUKON
IBEX PASS
CONCEPT PLAN
-ALTERNATIVE Nº 5-
Recreational Reserve
Mineral Development
Recreational Development
Grazing Area
Wildlife Management (Hunting, Trapping, Outfitting)
Removal Sites (Sawlog, Fuelwood)
Access Road
Pipeline Route (Proposed)
Hiking Trail
IBEX PASS STUDY
REID, CROWTHER & PARTNERS LTD
DATE: 83 JAN 7
FIGURE: 20


YUKON
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-ALTERNATIVE Nº 5-
Recreational Reserve
Mineral Development
Recreational Development
Grazing Area
Wildlife Management (Hunting, Trapping, Outfitting)
Removal Sites (Saulog, Fuelwood)
Access Road
Pipeline Route (Proposed)
Hiking Trail
POTENTIAL ACTIVITIES
IBEX PASS STUDY

VI. IMPLICATIONS OF ALTERNATIVE MANAGEMENT STRATEGIES AND CONCEPT PLANS

A principal thrust of this study has been to ascertain current knowledge about the natural condition and human use of the Ibex Pass study area and from that base to present a series of possible options for resource management and land use planning. An attempt has been made to present management strategies and concept plans that are practical and which permit current uses of land to continue where this is desirable and in keeping both with sound resource management practices and conceptual planning.

As has been noted before opportunities do exist to render modifications to aspects of both management strategies and the concept plans without necessarily detracting from the rules ascribed to these strategies and plans. It might be possible, for example, to integrate aspects of zoning in one of the concept plans with those in another plan. All of these plans do, however, recognize the distinct characteristics of certain parts of the Ibex Pass study area; for example, the important wildlife habitat of Ibex Pass itself; the multiple land use conditions which exist in the southeast; and limited opportunities for providing access routes (as well as a limited desire on the part of most managers to enhance that access).

At the conceptual planning stage it is exceedingly difficult to render judgements on the physical, social and economic benefits and costs accruing to any of the strategies or concept plans described above, other than in the most subjective way. Some of the more critical elements of landscape and species management that are required for the area have been widely articulated prior to this study: they are recognized here too and eventually will have to be assessed by decision-makers as to their relative significance vis-a-vis potential land use developments. By the same token the study area is in close proximity to Whitehorse's urban population and offers considerable opportunities for recreational activities for that population. These opportunities have been recognized in the concept plans developed for the report.

VII. FUTURE REQUIREMENTS

INTRODUCTION

This study was prepared on the basis of the acquisition of the most up-to-date information available on the study area and many discussions with resource managers, researchers, area users and residents and the like. Evaluation of input from these combined sources point to the requirement for additional enquiries in the study area, both in the sense of base information and in the implementation of area and site planning. The following paragraphs deal briefly with these needs, all of which are required to successfully implement concept plans and associated ground management during the next few years.

JURISDICTIONAL NEEDS

Hitherto something of a vacuum has existed with respect to agency aims and objectives for the study area. Put another way, individual organizations may have some distinct views on management priorities, but these have not been coalesced into a cohesive set of land management strategies. If we assume that this resource study represents a positive contribution to decision-making respecting future management of the Ibex Pass area then it behooves the administering agencies to look to their existing aims and objectives for the area to determine ways in which institutional arrangements may be developed to meet area planning goals.

Certain initiatives have been considered in the past. For example, there has been discussion of the prospect of the study area being included in a Block Land Transfer. The implications of such a decision would be considerable. Such a move would certainly affect the means by which our recommendations would be initiated. If the Yukon Territorial Government were to take over more planning responsibilities, it could, for example, revise the Area Development Act to encompass a much wider area for land use control.

In the meantime the sorting out and transference of jurisdictional powers continues. This process critcially affects the land management process. Some of policy areas which are criticial concern are:

1) General goals/policy to guide the direction of land utilization.

2) Specifically a new/revised policy for managing placer and quartz mining in Yukon.

3) An agricultural policy jointly agreed on by the Federal Government and Yukon Territorial Government.

BASELINE NEEDS

Certain portions of the data information base are inadequate. The following list indicates where more information is needed.

1) Vegetation - no information is now available on rare species of vegetation.

2) Wildlife - limited information only is now available on:

moose (paticularly summer surveys)

caribou (population densities unknown)

elk (population densities unknown)

mule deer (population densities unknown)

Dall sheep (paticularly critical range, mineral licks and lambing areas outside of Ibex Pass region

grizzly bear (particularly movements, range requirements, population densities outside of Ibex Pass)

furbearers (no other information except for harvest date, muskrat and beaver survey)

3) Fisheries - limited information only available on species composition.

4) Land Use - limited information on:

land disposition - examination of land titles may be required

heritage resources outside of pipeline corridor

forestry - inventory information required regarding saw-logs/potential fuelwood available

recreation - limited information on degree of current recreational use

power production - limted information as to how future expansion might conflict/interact with fisheries/ recreation

mining - require information on actual extent of current mining activity and potential activity

fishing - no creek census information available

SITE PLANNING NEEDS

Prior to construction of the various suggested additions to the existing study area, it will be necessary to have detailed site plans prepared. These detailed plans will be required for: hiking trails, interpretive site development, picnic areas, campgrounds, warmup huts.

The first step in this process will be determining the specific site to be used. This location will depend on a combination of factors including land dispostion, suitability of soil and surficial geology, conditions, drainage, viewpoints, variety of environments, access to roads, sensitive habitat on wildlife areas.

After the location is determined, a detailed site design will be required. This would be followed by detailed construction drawings, construction, and construction supervision.

TIME AND BUDGET CONDITIONS

To meet the baseline data requirements it is suggested that if time permits, an annual budget be allotted to this area, to complete this work over the next five years. It is suggested that the annual budget be in the order of $35,000 - $40,000.00. This will ensure that information will be available for the preparation of detailed design needs. If this information is required within a shorter time frame then the annual budget could be increased to reflect this demand. A budget for detailed site planning needs is not appropriate at this time.

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APPENDIX A

APPENDIX A

CHRONOLOGY OF IMPORTANT EVENTS/DOCUMENTS
PERTINENT TO THE INEX PASS AREA SINCE ca 1977

Year	A		B		C
1977	Item/Date	Foothills Pipeline	Item/Date	Land Use Planning/Management	Item/Date	Individual Agencies/Organizations
	1)	P.C. 1977/2059 prohibits disposition of land in pipeline corridor pending prime route selection				
	2) March 21	Project referred to Minister of Environment by DIAND for review through FEARO. EAP chaired by R.M. Hill.				
	3) July 27	Interim report by EAP completed	1) October	Initiation of Whitehorse North Land Management Planning Project (WNLMPP), a cooperative planning program by YTG and DIAND		
	4) December	FEARO issues EIS guidelines				

Year	A Foothills Pipeline	B Land Use Planning/Management	C Individual Agencies/Organizations
1978	Item/Date	Item/Date	Item/Date
		1) April — WRAPP released in draft form. Circulated to residents within study area for their response.	
		2) May — Pursuant to provisions of Area Development Ordinance, Commissioner of Yukon Territory orders to be effective regulations and schedules for Whitehorse Periphery Development Area (Commissioner's Order 1978/110). Includes Whitehorse North and Whitehorse South. Regulations known as "Interim Whitehorse Periphery Development Area Regulations"	
		Amendments created by CO 1979/26; O.I.C. 1980/263; and O.I.C. 1981/268.	
	1) late in year — Initiating department role re WRAPP transferred to NPA in consequence of transfer of regulatory responsibilities.		

Year	A Foothills Pipeline		B Land Use Planning/Management		C Individual Agencies/Organizations	
1979	Item/Date	Item/Date		Item/Date		
	1) January	Foothills submits EIS to EMP	1) January	J.W. Wilson paper on "Government Land Use Policies in the South Yukon"		
			2) January	D.K. Redpath report on Land Use Programs in Canada, Yukon Territory		
			3) February	Whitehorse North Land Management Planning Project report completed, to be forwarded to Exec. Comm., YTG for its review, approval and implementation under the Area Development Act. Includes land management map.		
	2) March/April	Public Hearings conducted by EMP				
	3) April 28	Panel concludes it cannot yet complete review				
	4) September	Second report (dated August) released by EMP	4) September	a) Memo to Executive Committee, YTG re WALMPP	1) September	Fish Lake Water Source Evaluation for City of Whitehorse (Stanley)
				b) Record of Recommendation of Executive Committee of Yukon Territory re WALMPP (Sept. 13, 1979; no. 79-37-2) that recommendations of WALMPP will be implemented		

Year	A	B	C
1981	Item/Date	Item/Date	Item/Date
	1) March	Foothills submits first of several additional pipeline documents to be released during this year. Materials include Submissions 3-1 and 3-2, both pertinent to Ikm	
	2) April	EAP places questions before Foothills	
	3) June 16-18	Public hearings in Whitehorse	
	4) July	EAP report re Whitehorse/Ikm Pass area (released Aug. 5)	1) July DIAND releases Northern Land Use Planning Program Discussion Paper approved by cabinet
	5) July 29	EPA internal memo re env. and socio-economic aspects of Ikm Pass route. Findings generally similar with those of EAP rept.	
	6) Aug. 5	Foothills rejects findings of EAP in its Ikm report.	
		2) December	DIAND publishes pamphlet, A Guide to Territorial Use Regulations
		3) 1981	DIAND releases pamphlet, The Availability of Federal Crown Land, Yukon Territory
		4) 1981	DIAND publishes pamphlet, Northern Natural Resource Development: Requirements, Procedures and Legislature

Year	A Foothills Pipeline		B Land Use Planning/Management		C Individual Agencies/Organizations
1982	Item/Date	Item/Date		Item/Date	
		1) March	DIAND release Communique, "Transfer of Cottage Lots from Ottawa to Yukon Government"		
	1) July Public hearings on pipeline continued	2) April	YTG release "Land, A Yukon Resource, A Land Use Policy"	1) July	Water Board hearing re use of McIntyre Creek
		3) August	CYI release "Land Use Planning, Environmental Assessment and Land Ownership in Yukon"		

APPENDIX B

APPENDIX B
MAPS AND AIR PHOTOS USED IN STUDY

LAND USE/EXISTING - POTENTIAL

Underhill and Underhill, 1979. Alaska Highway Pipeline Project Route Alternative Factors (Whitehorse Area) series of 5 maps 1:50,000

711.500 Base Map
711.500a Land-Use (generalized)
Proposed Land-Use (potential uses for area)
Mineral Claims and Natural Resources

Wildlife Areas - critical areas - Department Intergovernmental Affairs Library 711.500 used as base for most Foothills maps EIS 3 2

AIR PHOTOS

Used by ELS

105D
roll A 23590
photos 109-118
90- 98
Roll A25047
Photos 112-120
130-140
141-150
155-162

Southern Lakes Ibex - approximate scale - 1:60,000
N - Mt. Ingram - McIntyre Cr.
4 lines
S - Mt. Ibex - Cowley Lake
1973 - 40,000 Ft. ASL
1978, August
30,000 ASL
lens 152.92
See back for additional info.
Air photo library Renewable Resources

A22355 (93-125) - Y. River
A20991, Whitehorse
A2099X, (69) Whitehorse
A18097 Whitehorse
A19425 67,68, 103, 104, Ibex
A18400 Alaska Highway Route
A23000 203, 204, Ibex
A22355 Whitehorse
A25006 Whitehorse photo 78 in
A22438 (1971) 40, 45, 80, 90, 135 in or close to ISA
A22194 (1970) 72, 75, 80, 83, 85, 90, ISA

MAPS

Canada, Department of Indian Affairs and Northern Development - Land Use - Mineral Claims, Claim Ownership Reference Map Sheet 105D, 1:250,000

"Claim Sheets" 105D11 (F'82), 12 (26 Jan. 80), 13 (Apr. 80), 14 (Jan. 2 82), Resources Division, Northern Administration Branch, Department Northern Affairs and National Resources.

Foothills Pipe Lines (South Yukon) Ltd. - Alignment sheets n.d.

3 sheets Ibex 20 of 42, 21 of 42, 22 of 42
Office Map Room - YK - 02 - 0200 - 20
21
22

Department of Mines and Resources, Federal Leases Map NTS Series Map 953A, updated to 9 August 1982. Department Indian Affairs and Northern Development.

Yukon Land and Resource Inventory, Whitehorse Map 105D.

Yukon Territorial Government. Existing Land Uses (preliminary) map, 1:100,000

Territorial Resources Base Map, Yukon Territory: 105D/11 revised to 12 Jan. 81; 105D/12 revised to 3 Mar 78; 105D/13 revised to 8 May 81; 105D/M revised to 4 Aug. 81.

APPENDIX C

APPENDIX C

PERSONS CONTACTED FOR IBEX PASS STUDY

Monty Alford	Water Survey
Colin Wykes	Environmental Protection Service
Scotty Roxburgh	D.F.O.
Aileen Horler	D.F.O.
Karen Mekenna	YTG - ELS
Flo Whyard	Mayor of Whitehorse
Dave Morgan	Forestry
Fred Greene	Forestry - Fuelwood Permits
Perry Savoie	Federal Land Use
Barney Smith	Bear Biologist
Mark Hambridge	Municipal & Community Affairs
Bob Friessen	YTG Lands Administration
M. Dennington	Canadian Wildlife Service
Fred Lambert	Yukon Electric
Paul Fletcher	Agriculture
Don Russell	Moose/Caribou
Dave Mossop Bob Hayes	]Raptors]
Bud McAlpine	DINA - Water Rights
Wally Hidinger	Highways
Gerry Whitley	Yukon River Basin Study
Kate Grapes	Geologist
Brian Slough	Furbearer Biologist
Dan Drummond	Whitehorse Conservation Officer
Ella Le Gresley	Land Use Administration City of Whitehorse
Walter Bilawich	Intergovernmental Relations
Dale Perry	Heritage and Cultural Resources
Doug Linzey	Whitehorse Copper
Gary Bauer	Yukon Electric
K. Koepke	Fire Management Office
Sheila Greer	Archaeologist

Paul Burton	YTG - Dept. of Tourism & Economic Development
John Spicer	YTG - Dept. of Tourism & Economic Development
George Sinfield	YTG - Dept. of Tourism & Economic Development
G. Ouamas	
M. Hoefs	Yukon, Department of Renewable Resources
T. Yarranton	Northern Pipeline Agency
D. Larsen	Yukon, Department of Renewable Resources
T. Nette	Yukon, Department of Renewable Resources
D. Davies	Yukon, Department of Renewable Resources - Resource Planning Branch
D. Porter	Yukon, Department of Heritage and Cultural Resources

APPENDIX D

APPENDIX D

CLIMATE OF IBEX VALLEY
(Based on Data from Whitehorse Airport)

	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept	Oct.	Nov.	Dec.	Ann.
Global Solar Radiation (MJ/m 2 day) (Monthly Radiation Summary)	1.303	3.972	9.411	15.442	19.878	21.219	19.011	14.755	9.016	4.321	1.670	.737	10.092
AIR TEMPERATURE													
Mean Daily (°C)	-18.9	-13.2	-7.7	-0.1	7.1	12.4	14.1	12.3	7.8	0.7	-9.0	-15.8	-0.8
Mean Daily Maximum (°C)	-23.1	-17.9	-13.3	-5.3	1.1	5.9	8.1	6.6	4.0	-3.0	-12.4	-19.7	-5.8
Highest Recorded Maximum (°C)	8.9	11.7	11.1	20.6	30.0	34.4	32.8	30.0	26.7	18.9	11.7	8.3	34.4
Lowest Recorded Minimum (°C)	-52.2	-51.1	-38.3	-26.1	-23.9	-1.7	0	-4.4	-10.0	-24.4	-40.6	-47.6	-52.2
Number of Days With Frost	31	28	30	28	13	1		1	7	21	28	31	219
Standard Deviation of Mean Daily Air Temperature (1931-1960) (°C)	6.3	4.3	3.0	2.4	1.2	2.1	1.2	1.3	1.4	2.1	5.1	6.3	1.2
Number of Diurnal Freeze - Thaw Cycles Based on Normal Daily Maximum and Minimum			7	30	12					30	3		82

Frost Free Period (days)

Frost Free Period	First Spring Frost	First Fall Frost	Longest Recorded Frost Free Period	Shortest Recorded Frost Free Period	Years of Record
87	June 5	Sept. 1	126	25	37

HUMIDITY

Mean Monthly Vapour Pressure (KP) Station, Seal Level and Vapour Pressure Normals Based on the Period 1953-1972	.15	.23	.27	.37	.51	.74	.92	.89	.70	.47	.30	.30	.48
Mean Precipitable Water Vapour 1948-1958 (mm)	3.50	3.44	4.06	5.49	9.19	13.41	16.84	16.04	12.02	7.39	5.80	3.83	8.42
Mean Relative Humidity (%)	80 78	82 72	79 60	74 44	75 35	72 36	74 40	77 43	80 50	77 63	83 79	85 82	

PRECIPITATION

Total (mm)	18.5	14.0	14.7	10.7	13.5	28.7	33.3	36.1	29.0	19.8	22.4	19.6	260.3

(cont'd)

	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept	Oct.	Nov.	Dec.	Ann.
Snowfall (mm)	20.6	15.0	16.5	10.7	2.8	.5		.3	3.8	13.7	23.1	20.8	127.8
Number of Days with Measurable Precipitation	13	10	8	6	6	9	11	10	10	9	13	13	118
Number of Days with Measurable Snow	13	10	8	5	2	1		1	1	7	12	13	71
Mean Depth of Snow on Ground at End of Month (cm) (Meteorological Data Summary)	31	32	22	4						3	16	25	
Greatest Monthly Total Precipitation (mm)	46.0	37.1	36.3	37.8	38.4	90.0	84.6	103.4	64.5	50.5	51.8	42.4	
Lowest Monthly Total Precipitation (mm)	1.6	2.5	1.5	Tr	.8	6.9	5.6	8.9	6.6	1.0	4.3	5.1	
Greatest Precipitation in 24 Hrs. (mm)	9.4	10.4	10.4	14.2	12.4	30.2	21.2	30.7	21.6	23.6	11.4	10.9	30.7
WIND SPEED													
Average Speed (km/hr)	13.1	15.4	14.3	14.4	14.4	12.7	12.3	12.6	13.9	16.3	15.5	14.8	14.1
Percentage of Calm	17.8	12.3	12.3	8.4	8.4	9.5	9.8	11.2	10.7	9.4	11.7	15.1	11.4
Prevailing Direction	SSE	SSE	SSE	SE	SE	SE	SE	SE	SE	SSE	S	S	SSE
Greatest Recorded Hourly Wind Speed (km/hr) and Direction	72 SE	68 SSE	64 SE	60 N	64 SSE	56 SE	63 ESE	48 SSE	72 S	63 SE	68 SE	72 SSE	72 S/SE. SSE
Direction with Highest Average Wind Speed (km/hr)	SSE	SSE	SSE	SE	SSE	SE	SE	SE	SSE	SE	SSE	SSE	SSE
Probable Maximum Gust for Maximum Hourly Speed (km/hr)	102	97	92	87	92	82	91	71	102	91	97	102	102
MISCELLANEOUS WEATHER EVENTS													
Number of Days with Thunder					.2	2.2	2.4	.8					5.6
Number of Days with Fog	3.8	1.2	0.2	0.3	0.2	0.6	0.3	1.5	1.8	1.9	2.1	3.7	17.6